

GAME DESIGN & DEVELOPMENT (GDD)

GDD 101. Introduction to Game Design. 3 Credits.

This course introduces students to the practice of game design (board, card, dice, physical games, videogames), theories of game design and play, the study of the social effects of games, the role of serious games for teaching and learning and production practices in the game industry. Students learn critical analysis of games and the process of design documentation.

Prerequisites: None

Offered: Every year, All

GDD 110. Introduction to Visual Design for Games. 3 Credits.

This foundation course prepares students for upper-level coursework by introducing critical, analytical and problem-solving strategies for researching and developing graphics for games. Topics include layout, color theory, font management, logo design, and user interface design. Practical hands-on methods include visual research, design journals, thumbnail sketches, concept art, pixel art, storyboarding and 2D development tools. Completed artwork is then integrated into game engines.

Prerequisites: None

Offered: Every year, Fall

GDD 140. Creativity and Computation. 3 Credits.

This course teaches software literacy within the visual arts and visual literacy within technology. Students develop basic coding expertise and the confidence necessary to create interactive artwork and games. The course teaches essential 21st-century skills including computational and systems thinking, along with quantitative reasoning coupled with creative problem solving and generative visual aesthetics. No previous experience with programming necessary.

Prerequisites: None

Offered: Every year, Fall

UC: Fine Arts

GDD 175. Special Topics in Game Design. 3 Credits.

Courses of particular interest to game design students offered on an occasional basis. These courses have no prerequisite. See the Special Topics Bulletin on the Registrar's website for specific course descriptions.

Prerequisites: None

Offered: As needed

GDD 200. Introduction to Game Development. 3 Credits.

This course provides a practical, hands-on overview of game development. Students learn how to make games from scratch by using a game engine to code behaviors and manipulate assets. Individual game development concepts are introduced incrementally. Students are required to demonstrate their understanding of these concepts through creative project work. Some programming experience is required.

Prerequisites: Take GDD 140 or CSC 110 or equivalent college level programming course.

Offered: Every year, Spring

GDD 201. Professionalism Practice for Game Design. 3 Credits.

In this course, students practice the skills necessary for professional work in game development. They develop a portfolio that showcases their skills and work using HTML, CSS, and Javascript and create polished game design process documentation. Topics include: researching and applying game analysis and theory to creative practice, brainstorming, prototyping, and playtesting game pitches.

Prerequisites: None

Offered: Every year, Fall

GDD 202. Game Art Pipeline 1. 3 Credits.

This course introduces students to the basic skills and pipeline for creating 2D and 3D assets for games and animation. Topics include: lighting, modeling and textures. Artwork is integrated into 3D game engines and optimized for performance.

Prerequisites: Take GDD 110. or permission of the program director.

Offered: Every year, Fall

GDD 204. Introduction to 3D Modeling. 3 Credits.

This class explores and develops essential skills interested in integrating new technologies into the practice of art, architecture, film, theater, animation, psychology, neuroscience, game design, sculpture, and more. This class is suited both for those wanting to expand their abilities with 3D software or discover how to use them for the first time.

Prerequisites: None

Offered: As needed, All

GDD 207. Digital Music Composition for Games. 3 Credits.

This course covers the fundamentals of audio creation and implementation for games using a variety of software and digital tools. Readings on theory are integrated with group discussions and critique of student work. Classwork is project-based and students are encouraged to design audio for projects being developed in other classes.

Prerequisites: None

Offered: As needed

GDD 210. Game Lab I: Team Projects. 3 Credits.

This is the first of a two-course sequence focusing on game production, coding, prototyping and playtesting. In Game Lab I, students work individually and in teams to define and develop game concepts, research content, develop game mechanics, create game assets and build working prototypes. Prerequisite may be waived with permission of the program director.

Prerequisites: Take GDD 200.

Offered: Every year, Fall

GDD 211. Game Lab II: Team Projects. 3 Credits.

This course is a continuation of GDD 210. Students continue to work in teams to build working prototypes while learning about the game development process, project management, play testing and usability testing. Prerequisite may be waived with permission of the program director.

Prerequisites: Take GDD 210.

Offered: Every year, Spring

GDD 215. eSports Management.**3 Credits.**

This course is designed to teach students how to recruit, retain, develop and manage eSports teams. Students also explore the eSports industry, its rise and growth, trends in the space and where the field is likely to go. Finally, students discuss the business of eSports and look at possible opportunities that may arise from the growth of this new competitive space, including impacts on student athletes and colleges, professional teams, the world of sports (including the Olympics), and sponsorships. Prerequisite may be waived with permission of the program director.

Prerequisites: Take GDD 101.**Offered:** As needed**GDD 220. Games for All.****3 Credits.**

There is a common misconception that making digital games requires complex software, large teams, and advanced technical skills. While that was once true, now, anyone can make a game. Many freely available online tools, supported by active communities, allow new creators to make short, impactful experiences, often celebrating creativity, diversity, and expression. These tools use constraints to simplify the development process, requiring creators to consider games from a specific perspective (e.g., storytelling, world-building, problem-solving). This class uses these tools as entry points for students to explore and discuss different perspectives on game creation, enabling a natural marriage of theory to practice.

Prerequisites: None**Offered:** Every year, Fall**GDD 250. Interactive Storytelling and Narrative.****3 Credits.**

This course draws from English and Game Development & Design to explore the craft and purpose of interactive storytelling. Course content will cover both the creation and analysis of various interactive texts. Students in this class will combine basic coding language with creative writing principles to produce a complex interactive narrative. The interactive narrative will serve as a semester-long project that emphasizes autonomous characters, a responsive setting, and meaningful story branches navigated by a user. Students will also develop a theoretical understanding of interactive media

Prerequisites: None**Offered:** As needed**GDD 290. Internship.****1-3 Credits.**

Under the supervision of a faculty member and a participating private company, corporation, institution or community organization, students gain real-world experience working in the field of game design or related fields. For majors or minors in game design and development. Requires permission of the program director.

Prerequisites: None**Offered:** Every year, All**GDD 301. Game Design Tools and Processes.****3 Credits.**

Students examine games from different perspectives and investigate how those perspectives affect the design process. Project work encourages students to consider the physical, cognitive and narrative potential in games. Students use a number of game-making tools that support these perspectives.

Prerequisites: Take GDD 210 or CSC 110.**Offered:** Every year, Spring**GDD 302. Game Art Pipeline II.****3 Credits.**

Students continue working with software tools required for designing and building 2D and 3D assets such as characters, costumes, props, levels, environments and worlds.

Prerequisites: Take GDD 202.**Offered:** Every year, Spring**GDD 303. The Art of Audio Narrative.****3 Credits.**

This course is about storytelling. Students learn the basics of multi-track audio recording and mixing. They write and produce fiction and nonfiction audio narratives. Each project is shared in a stimulating and mutually supportive workshop environment. Students read and listen widely to gain a sense of the history and theory of radio art. Participants also spend time identifying target audiences and looking at ways to distribute student work to the larger world of public and independent radio. Prerequisite may be waived with permission of program director.

Prerequisites: Take GDD 101.**Offered:** Every other year, Fall**GDD 307. Peer Mentorship.****1-3 Credits.**

Peer Mentors will assist faculty members teaching technical classes by assisting students who are encountering problems during the class itself and by monitoring the class communication hubs. As they assist others, students gain a deeper understanding of the subject matter, as well as the use of pedagogical techniques that communicate their knowledge to others. Teaching becomes a catalyst for their ability to communicate and their intellectual growth and problem-solving skills.

Prerequisites: Take GDD 101 and GDD 110 and GDD 140 and have permission from the instructor.**Offered:** As needed**GDD 310. Game Lab Iii: Team Projects.****3 Credits.**

The topic of this Game Lab rotates to allow students to explore other game engines, modalities, and publishing formats for games. These include: Introduction to Unreal and Mobile Game Design, and Advanced AR/VR. Prerequisite may be waived with permission of the program director.

Prerequisites: Take GDD 200.**Offered:** Every year, Fall**GDD 311. Game Lab IV: Team Projects.****3 Credits.**

This Game Lab provides students with an experiential learning opportunity by building a game for a client or for publication. Students work in teams to build working prototypes and manage the life cycle of the game development process including troubleshooting, playtesting, usability testing and revisions. Prerequisite may be waived with permission of the program director.

Prerequisites: Take GDD 211 or permission of the instructor.**Offered:** Every year, Spring**GDD 314. VR/AR Development for Games.****3 Credits.**

This course is an exploration into the potentials of Augmented and Virtual Reality in play and games. Students learn the skills to design and develop Virtual Reality applications for dedicated headsets and Augmented Reality applications for smartphones in Unity. Prerequisite may be waived with permission of the program director.

Prerequisites: Take GDD 200.**Offered:** Every year, Spring**GDD 316. Advanced Topics in Game Development.****3 Credits.**

Modern games rely on a range of algorithms and mathematical techniques to generate compelling dynamic game mechanics. This course develops advanced topics through mediated examples, playtesting and collaborative projects. Students build working prototypes that leverage applied math to generate complex game mechanics.

The course will review basic mathematical tools for game physics, transforms, trajectory and mesh generation. More complex behaviors and movements are addressed through algorithms for procedural generation, agents, artificial intelligence, swarms and dynamic surfaces.

Prerequisites: Take GDD 200 or CSC 110**Offered:** Every year, Spring

GDD 320. Cross Collaboration.**1-2 Credits.**

This course enables students not enrolled in the course to collaborate with a game team in a GDD Game Lab. Students are responsible for defining course deliverables in consultation with their teammates and the faculty teaching the Game Lab. Permission of the program director needed.

Prerequisites: None**Offered:** As needed**GDD 333. 3D Sculpture: Creatures and Characters.****3 Credits.**

Have you ever seen an amazing character or creature in a video game, a show, or movie and wondered about creating your own? In this course, we'll dive into fictional worlds and take your own creatures and characters from imagination to reality, and learn the process behind the scenes. Explore advanced sculpting techniques and workflows from ZBrush to Substance Painter, following the pipeline used by industry professionals to bring extraordinary creatures and characters to life. This upper-level course is designed for students who have completed GDD 202, have prior 3D sculpting skills, or who have instructor permission.

Prerequisites: Take GDD 202.**Offered:** As needed**GDD 350. Board Game Design.****3 Credits.**

This course provides an introduction to the design of table-top and board games. Board games share many ideas with digital games but utilize different game mechanics. Designing for board games explores the practice of alternate approaches to game design, and the skills learned in this class can be applied to both. Topics include design, history, manufacturing and different genres such as classic board games, deck-building games and card-based strategy games.

Prerequisites: None**Offered:** As needed**GDD 370. Acting and Directing for Game Design.****3 Credits.**

This course provides an introduction to the craft of directing and acting for game production. Topics include story analysis and interpretation, director's concept, and the history and theories of directing. Students learn the basic principles of acting, including scene analysis, motivation, intention and character work. They perform exercises, monologues and scenes. Additional topics include methods of actor coaching, rehearsal techniques and working with the creative game design team.

Prerequisites: None**Offered:** As needed**GDD 380. The Business of Games.****3 Credits.**

This course helps students gain an understanding of how to develop and run a successful video game business. Students look at existing businesses and new businesses as models and cautionary tales. Topics include developing financials, how to market a business, building a strong company culture, how to crowdfund and how to incorporate.

Prerequisites: None**Offered:** As needed**GDD 390. Internship.****1-3 Credits.**

Under the supervision of a faculty member and a participating private company, corporation, institution or community organization, students gain real-world experience working in the field of game design or related fields. For majors or minors in game design and development. Requires permission of the program director.

Prerequisites: None**Offered:** Every year, All**GDD 394. History of Video Games.****3 Credits.**

Video games are an interactive medium grounded in step-by-step innovation in console and computer systems combined with parallel development in software capabilities. This course examines the cultural, social and educational aspects of games and considers how they changed over time in response to market pressures, societal concerns about content and technological development. Students play and analyze historical games, learn how to write game reviews and research new phenomenon in game development.

Prerequisites: Take GDD 101 or permission of the program director.**Offered:** Every year, Spring**GDD 395. Critical Game Studies Seminar.****3 Credits.**

In this course, students address topics in game studies, ludology or play theory to develop critical, conceptual and cultural understandings of narrative, meaning and identity in games. The course also addresses the design and development of serious and meaningful games and the aesthetic, social and technological implications of new emerging forms. Prerequisite may be waived with permission of the program director.

Prerequisites: Take GDD 101 or PL 101.**Offered:** Fall**GDD 396. Games, Learning & Society.****3 Credits.**

This course addresses the design, use, and assessment of serious and meaningful games in education. The class has both theoretical and applied components. Students will conduct literature reviews to understand current practice in a specific area of applied games, i.e. outcomes assessment, data collection, games for physical therapy, games for diabetes management, games to train surgeons, etc. and then produce a research paper on their area of focus. Students will then design, prototype, and test an applied game that addresses an actual societal need. Partnership with outside individuals and institutions is encouraged and supported.

Prerequisites: None**Offered:** As needed**GDD 399. Independent Study.****1-6 Credits.**

Under the supervision of a faculty member, students pursue self-directed research and in-depth study in a subject that is not covered by the existing curriculum.

Prerequisites: None**Offered:** As needed**GDD 401. Animation and Cinematics.****3 Credits.**

This course explores advanced aesthetic, critical and technical topics in 3D computer graphics and animation. Students produce concept sketches, storyboards, animatics and low and high resolution renderings to complete a short 3D digital video animation that demonstrates both knowledge and understanding of the 3D computer graphics production process, a creative approach to storytelling and character development.

Prerequisites: Take GDD 202.**Offered:** Every year, Fall**GDD 402. Technical Art Production.****3 Credits.**

Students continue with more advanced work using software tools required for designing and building art assets. Topics include techniques of advanced 3D modeling, rigging, texturing, lighting, motion capture and animation, scene planning, virtual camera angles, rendering, editing and compositing.

Prerequisites: Take GDD 202.**Offered:** Every year, Fall

GDD 403. Professional Apprenticeship. 1-2 Credits.

This course provides students with the opportunity to work one-on-one with a game industry professional to advance and refine their skills. Students are responsible for defining course deliverables in consultation with their professional mentor. Permission of the Program Director necessary.

Prerequisites: None

Offered: As needed

GDD 405. Game Audio Design. 3 Credits.

This course covers sound design for games while exploring techniques of digital sound synthesis, recording, sampling and editing. Prerequisite may be waived with permission of program director.

Prerequisites: Take GDD 200.

Offered: As needed

GDD 410. Game Lab V: Team Projects. 3 Credits.

Game Lab V and VI form a two-course sequence that builds upon the knowledge and skills of prior courses. With a focus on the process of iteration, this course extends the experience of game production, coding, prototyping and playtesting gained in previous Game Labs. Students learn the basics of agile development and how to put it into practice. For game design and development majors.

Prerequisites: Take GDD 211 and senior status or permission of the program director.

Offered: Every year, Fall

GDD 411. Game Lab VI: Team Projects. 3 Credits.

This course is a continuation of Game Lab V. At the end of the semester, teams present a working game and provide documentation of their design and development process. Prerequisite: For game design and development majors.

Prerequisites: Take GDD 410 and senior status or permission of the program director.

Offered: Every year, Spring

GDD 490. Internship. 1-3 Credits.

Under the supervision of a faculty member and a participating private company, corporation, institution or community organization, students gain real-world experience working in the field of game design or related fields. For majors or minors in game design and development. Requires permission of the program director.

Prerequisites: None

Offered: Every year, All

GDD 495. Senior Project and Seminar I. 3 Credits.

This course is the senior capstone in the major. Students reflect on how their academic experience and extracurricular activities during their undergraduate years have shaped their personal goals and aspirations. Students refine and polish their portfolio, produce a resume and other professional materials and prepare for their careers after graduation. This course counts as the university's Integrative Capstone requirement for Game, Design, and Development majors.

Prerequisites: Requires senior status and a major or minor in game design and development.

Offered: Every year, Spring

GDD 499. Independent Study. 1-6 Credits.

Under the supervision of a faculty member, students pursue self-directed research and in-depth study in a subject that is not covered by the existing curriculum. Prerequisite: Junior or senior standing.

Prerequisites: GDD tutorial courses required for graduation are offered as needed.

Offered: As needed