VIDEO GAME DEVELOPMENT & DESIGN (VGD)

VGD 114 Introduction to Game Development
2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours
This course is an overview of the game development industry. Students will learn what is involved in developing a professional game from start to finish. Topics include the game development life cycle, developing a budget and game specification documents. Students will also be exposed to important physics, math and artificial intelligence concepts relevant to game development

VGD 115 Digital Graphics for Gaming
2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours
Students will develop a working knowledge of how 2D images are manipulated on the desktop, using Adobe Photoshop. Topics consist of image creation, retouching, color correction, and compositing images together to form a final design. Emphasis is placed on the use of Photoshop as it pertains to creating and editing 2D images used in games.

VGD 126 2D Content Creation Tools for Games
2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours
Prerequisites: VGD 115 and GDS 111
In this course students will explore various tools, graphics formats and techniques used for creating 2D assets for video games. Topics will include raster and vector graphics, pixel art, and animation. Students will also be introduced to concepts and concerns surrounding the design and implementation of 2D graphics in programs.

VGD 129 Technical & Visual Communications for Game Designers
2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours
Prerequisites: VGD 115
Visual communication is often more effective than written or spoken communication. Like other forms of communicating, visual communication has its own set of rules, slang and conventions. Technical documents and communications support successful project design and completion. The goal of this course is to teach students about the fundamentals of effectively organizing and communicating ideas through graphics as well as planning their projects out with industry standard technical documents they may find in the field. Among the topics addressed in this course are the logical organization of information, presentation skills, and the importance of understanding cultural and historical aesthetics as well as flowcharts, Gantt charts, and wireframes.

VGD 133 3D Modeling I
2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours
Prerequisites: GMW 112 or VGD 115
This course will cover the language of and the fundamentals of creating low polygon three-dimensional assets for video games. It will start with modeling basics: primitives and sub-object modeling using box, spline and polygon modeling techniques. The course will then progress to model unwrapping and mapping, creating custom textures for meshes and model optimization for export to 3D game engines. Students will also learn the fundamentals of rendering and animation in a 3D modeling program.

VGD 222 Skills RI Game Dev

VGD 242 3D Modeling II
2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours
Prerequisites: VGD 133
This course will build on the fundamentals learned in Modeling I (VGD 133) providing the opportunity to learn more refined and advanced techniques in 3D modeling, rendering and animation. Topics covered along with advanced modeling techniques include advanced tools, materials, lighting, and levels of detail.

VGD 244 Unity I
2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours
This course will provide a foundation in the tools, techniques, and production methods for creating game environments and successfully using Unity 3D in production situations.

VGD 251 Introduction to Level Design
2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours
Prerequisites: VGD 114 and VGD 244
In this course, students will learn and employ the fundamentals of game level design. The level designer is responsible for creating an engaging environment for the player and to use techniques that will lead the player through the level toward a successful game conclusion. Using the iterative process of development, students will create basic game level environments with assets, enabling rapid prototyping to develop the game play. Level Design fundamentals taught through selected readings, videos and critiques will be employed by the student to improve their game in each succeeding iteration of development.

VGD 256 Unity II
2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours
Prerequisites: GDS 137 and VGD 244
This course will expand the use of the Unity 3D tool in a production. Students will use JavaScript, C#, to enhance interactivity and gameplay, while also deploying characters, objects, sounds and textures required for the development of a basic 3D game.

VGD 259 Storyboard and Design
2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours
Prerequisites: VGD 129
This course introduces students to the concepts and techniques of visual storytelling through storyboard creation. Students will execute storyboards ranging from simple sequence events to cinematic scenes. The course also covers storyboard pitching and presentation techniques. Students will also learn basic principles of design, composition and layout.

VGD 261 Game Testing
2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours
Prerequisites: VGD 251
In the video game industry, the prevalent entry level position is Game Tester. Having completed the previous curriculum of courses, the student is well prepared for this employment position. The goal of this course is to prepare students for employment as a Game Tester at a video game company in a "realworld" mock-up classroom environment. In this course, students will prepare their professional resume and supporting portfolio for employment submission. As Game Testers, students will assume the role, employing their game development and design skills to game test 2D and 3d games. As Game Testers, their role is to seek and find game functionality issues or problems that need correcting. They will play games to find "bugs." When found, game testers document the found issues in a report to be sent to the development team for addressing. This is not a coding course: no code will be examined.

VGD 263 Digital Audio and Video Editing
2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours
This course addresses the importance and need in today's fast-paced digital world, to create an effective demo reel of work. The goal of this course is to teach not only the technical skills required to produce a demo reel, but to also help students in evaluating their work and how to put their best foot forward. Examples of successful demo reels from large design and gaming firms to independent artists and producers will be shown and used to illustrate key points of what makes certain demo reels stand out from the others. Learning diverse concepts from transitioning and pacing to determining the correct audio to be used, will all factor into creating a successful demo reel. Students will come away from this course with an outstanding showcase of their work that can be delivered over multiple platforms on the Internet including YouTube and Vimeo.

VGD 264 Introduction to Texture and Lighting
2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours
Prerequisites: VGD 242
This course builds on the basics of modeling learned in VGD 133 and VGD 242. Students will learn to create advanced shader textures containing multiple elements for mapping on to game model assets and characters using a variety of methods. Additionally, students will learn techniques to better prepare models for the rendering process. Static and Real-Time lighting will be explored along with various light types and their attribute qualities. Advanced tools will be utilized for exploring rendering of scenes.

VGD 268 UI/UX Design Principles
2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours
Prerequisites: VGD 259 and VGD 115
Students will work in teams to create a good user experience through the development of physical and virtual user interfaces for a video game. Students will document the process of developing conceptual materials, functional specifications and visual assets.

VGD 371 Advanced 3D Modeling
2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours
Prerequisites: VGD 242
Expanding on previously learned modeling techniques, students will create fully renderable game assets through a series of projects that increase in complexity. Projects include complex UV and texture mapping techniques, baking detail from hi-poly models onto low-poly assets, and collision models. The emphasis in this course will be on game environments and assets.

VGD 373 Animation I
2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours
Prerequisites: VGD 126 and VGD 242
This course addresses the core fundamentals, history and terminology of traditional animation using modern video game and interactive media production techniques as the context. The goal of this course is not only to teach students technical skills, but also to help them form a rich understanding of animation concepts that can be utilized regardless of future technological capabilities and limitations. Examples of animation from film, television, games and websites will be shown and discussed frequently throughout this course to demonstrate and reinforce key points. Industry standard 2D and 3D content creation tools will be utilized to aid students in demonstrating their understanding of the topics covered.

VGD 380 3D Digital Sculpting
2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours
Prerequisites: VGD 242
Using 3D modeling and sculpting programs together with 3D painting tools can yield amazing game assets with detail not easily achievable with standard modeling practices. Building on existing modeling skills, this course will immerse students in the professional modeling pipeline for model asset creation for games.

VGD 384 Game Engines
2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours
Prerequisites: VGD 256
This course will use a game engine with a variety of tool sets as the principle context for exploring modern video game and interactive media production techniques. The goal of this course is not only to teach students technical skills, but also to help them form a rich understanding of workflow concepts that can be utilized regardless of future technological capabilities and limitations. Examples of games and websites will be shown and discussed frequently throughout this course to demonstrate and reinforce key points. Industry standard 2D and 3D content creation tools will also be utilized to aid students in demonstrating their understanding of the topics covered.

VGD 390 Advanced Animation I
2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours
Prerequisites: VGD 373
Advanced Animation I is a project-based course focused on strengthening students' understanding of 3D character animation. Students will utilize skills learned in previous animation and 3D modeling courses to create short character animations that tell a story. Topics to be introduced and reinforced are blocking, walk cycles, facial animations, sync-sound, planning, process, iteration, and critique.

VGD 392 3D Scripting & Advanced Rigging
2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours
Prerequisites: VGD 371
Utilizing the native scripting languages of 3D modeling software, technical artists can create simple to complex tools and scripts to aid in the creation of models, animations and processes. Students will use 3D modeling scripts within modeling programs to manipulate meshes, control objects and actions. Building on these scripts, students will apply scripts to control advanced rigging of props and characters.

VGD 394 Game Analytics
2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours
Prerequisites: VGD 256
Today, game companies depend heavily on game testers to evaluate their game's playability before and after deployment, as part of the quality control process. In game testing, the quality of the software, the handling of assets, and the game play are scrutinized for defects (bugs). In this course, students will develop game testing skills through a series of game play exercises which will require detection of bugs, of defects and of game play compromises. Students will document the found errors in typical game tester report formats common to the industry. Additionally, this course will explore how game analytics are used to adjust and modify games based on the tracking of player interaction with the game.

VGD 404 Advanced Texturing
2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours
Prerequisites: VGD 371
Expanding on previously learned techniques for texture creation, students will create high-quality textures through a series of projects that increase in complexity. Projects include creating textures from source images, creating textures from a blank canvas, and the creation of multipass shaders. The emphasis in this course will be on textures for game environments and assets.

VGD 408 Virtual Production/Motion Capture
2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours
Prerequisites: VGD 392
Students will be immersed into the non-linear editing paradigm of virtual production. Using motion capture, designers will acquire, aggregate and refine data from actors to create, edit and play back complex character animations. The motion files created will be transferred to virtual characters for use in the virtual worlds within film, games and television.

VGD 412 Game Industry Perspectives
2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours
Prerequisites: GDS 370
The game industry is a big money business and spans the spectrum between the singular hobbyist and the massive-multinational corporation. This spectrum can make it challenging for VGDD students to visualize the entry footholds on such a broad career path. Students in this course will explore the obstacles and best practices that define a game developer from independent project studio to "Triple A" mainstream company. Students will be introduced to the functional, legal and financial aspects of a creative company at its various scales of operation. Students will model themselves as specialists and apply their skills to a variety of weekly experiments that build toward a final project.

VGD 417 Introduction to Virtual Reality Development
2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours
Prerequisites: GDS 268
This course is designed for students who are new to virtual reality and want to learn about the principles of VR technology including optics, displays, stereopsis, tracking, and major hardware platforms. Students will use various display and interface devices available for the course, develop prototype applications, and evaluate them. The format of the course will be a combination of traditional lecture, literature review, and hands-on work. Students will be expected to implement several techniques as part of this course. This course applies cutting-edge VR technology currently available in academia and industry. Students will design, model, and script the VR environment by developing a complete VR application as a group project.

VGD 419 Design Studio I
8 Lab Hours, 4 Quarter Credit Hours
Prerequisites: VGD 390 and VGD 392 and VGD 404 and VGD 380 and VGD 384 and VGD 394 and VGD 412 and VGD 417 or GDS 422 and GDS 370 and GDS 375
Previously in the VGD curriculum, students have gained exposure to and has had experience with the major aspects of design development in the video game industry. This course is designed to allow students to gain specialization in an aspect of design development of their choosing, such as modeling, texturing, VR, game animation, UI/UX, etc. Students work closely with the course instructor and, if required, a faculty specialist, to refine their individualized, independent course of study with the goal of developing specialized skills and proficiency, as exhibited through the creation of portfolio quality work in a specific design aspect of the video game industry.

VGD 422 Special Projects
12 Lab Hours, 4 Quarter Credit Hours
Prerequisites: GDS 268
In this Special Project Lab course, a student earns credit while working on an extracurricular project under the supervision of a discipline-specific instructor and a potential employer. Qualifying projects must feature a limited tangible product for an internal or external professional client. Projects may be executed by one student or a team of students. Students can work as unpaid interns, paid interns, or with scholarship or project result agreements. All engagements requesting a tangible product as an outcome require a memo of understanding to define the scope and protect the student and university from unreasonable expectations.

VGD 429 Design Studio II
8 Lab Hours, 4 Quarter Credit Hours
Prerequisites: VGD 419
This course builds on Design Studio I, extending the student's individualized, independent course of study, specializing in a specific design aspect of the video game industry. Students will also have the option to create a new individualized, independent course of study to explore a related aspect of the industry from the topic chosen in Design Studio I or an unrelated aspect from the design side of the video game industry. Like Design Studio I, this course has the goal of developing specialized skills and proficiency, as exhibited through the creation of portfolio quality work, in a specific design aspect of the video game industry.