DIG4715 Game Development

Instructor
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Office Location
NRG 102

Office Hours
TBD

Course Number
DIG4715

Semester/Year
Spring 2020

Course Credits
3 credits

Course Location
NRG 120

Course Meeting Times
MW Period 7/7-8
TH Period 8-9/9
UFO

Course Description

This course elaborates on concepts and technical practices introduced in DIG3713C to craft effective digital games. Students will examine conceptual techniques in game design and their use in DAS design practice, explore comparative introduction of frameworks for game design, and practice technical components of 2D and 3D game design.

Pre-Requisite Knowledge and Skills

BA in Digital Arts and Sciences major, DIG3713 with minimum grade of C

Objectives: By the end of this course, students will be able to:

- Schedule and document a multi-milestone development cycle
- Implement a 3D software to engine development pipeline
- Create 3D assets, textures, and advanced materials
- Edit and animate 3D characters
- Organize 3D environment lighting
- Build gameplay systems and scripts
- Craft and evaluate all aspects of a complex indie-style 3D video game from initial concept to final game build

Required Materials

- Unity HUB and Unity 2019+ *(Free registration required)*
- Visual Studio *(or similar scripting software)*
- Autodesk Maya *(Free registration required)*
- Adobe Photoshop CC

Recommended Materials

- GitHub Code Repository *(Free registration required)*
- Lynda.com Online Unity Tutorials *(Free access for UF students)*
- Official Unity Development Community https://unity3d.com/community
- Autodesk Academy https://academy.autodesk.com
- Autodesk Indestructables Community https://www.indestructables.com/howto/games/
- ArtStation https://www.artstation.com
- Digital Graphic Drawing Tablet with Pen (Photoshop compatible)

Course Schedule

This course incorporates lecture, discussion, quizzes, and group learning projects. Individual assignments will be explained in detail as the course progresses. The final exam time scheduled for this course will be announced in advance of each semester by the University of Florida Registrar's Office at http://www.registrar.ufl.edu/soc/

Week	Subject	Assignments Due
Week 1	**Introduction to 3D Game Development** Syllabus Overview Three-Dimensional Game Pipelines Vertical Design Methodology	None
Week 2	**3D Game Design Document (GDD) Creation** Systems Design for 3D Elements Pathing and Navigation in a 3D World Complex Character Design Discussion Virtual Space and Physical Scale for 3D Games Interactive Storytelling Discussion	GDD V1.0 *Design document outlining all characters, environments, and gameplay systems for a custom 3D video game*
Week 3	**3D Development Pipeline** Maya to Unity to Maya Iterative Development Pipeline Unity ProBuilder System Exercise Physics-Based Rendered Material Creation Exercise The FBX Exporter Optimal Settings and Use 3D Collision Application and Options	3D Asset with PBR Material *Two custom 3D model variants with complex multi-texture materials applied*
Week 4	**3D Character Development** Hierarchy Design for Maya Character Creation Character Skeletal Dependencies Maya Keyframe Animation Exercise Maya to Unity Animation Pipeline	Animated 3D Player *Gif or video demonstrating a 3D character mobility and idle cycles in Maya*
Week 5	**User Interfaces For 3D Games** Integrating 3D Models into User Interface Functionality Positional Dialogue Techniques Designing Consistent Interface Components Encounter Volumes in a 3D World	UI Screenshots *Two screenshots in Unity of 3D Health or Lives along with positional dialogue component*
Week 6	**PROTOTYPE MILESTONE** Whitebox 3D Game Level With ProBuilder Exercise Player Navigation, Physics, and Camera in a 3D World Basic Gameplay Systems Overview Milestone Readme.txt Discussion Introduction of Visual Design Rules in Whitebox Updated GDD exercise	**PROTOTYPE MILESTONE GDD V2.0** ***Game executable build containing a whitebox 3D environment with basic core gameplay in place, and updated design document***
Week 7	**Lighting, Color, and Post-Processing** Ambient and Directional Lights Spot, Point, Custom Light Techniques Prefabs With Lighting Exercise Particle Editor and Systems Review Global and Local Post-Processing Systems Development	Lighting Screenshots *Two images in Unity showing in-game lighting, post-processing systems, and particle effects functioning correctly*

Week	Subject	Assignments Due
Week 8	**MIDTERM MILESTONE** Creating In-Game Tutorials and Learning Objectives Developing 3D Key Assets and Encounters Timing, Pacing, and Delivery Tuning Discussion Game Scope and Scale Evaluation Exercise	**MIDTERM MILESTONE** *Game executable build containing near final art, systems, and design elements*
Week 9	**Bug Testing, Tracking, and Prioritization** Strategies For Testing 3D Worlds and Content Bug Tracking Software and Methodology Overview Scheduling Game Development To Gold Master Exercise Scope and Feature Cutting/Triage Discussion	Prioritized Bug Report *Document listing all current bugs, missing features, cut content with priority and delivery dates*
Week 10	**Auxiliary Game Levels** Game Start and Introduction Screens Assembling a Multi-Scene Story Game Transition Screen Design Outro, Game Over, Credits Screens	Aux Game Screenshots *In game screenshots showing the Game Start and Credits screen designs*
Week 11	**Game Optimizations** 3D Asset Collision Optimization Exercise Prefab Creation and Benefits Texture Size and Packing Discussion Optimization Lighting Pass and Settings	Optimization List *Document listing all actions taken to optimize content in your game*
Week 12	**BETA MILESTONE** Content Lockdown and Game Evaluation Feature Complete Testing Exercise Peer-to-Peer Gameplay Sessions GDD Update to Final Exercise	**BETA GAME BUILD** GDD V3.0 *Feature complete game executable build deliverable along with updated final design document*
Week 13	**Advanced Game Audio** 3D Global and Local Sound Techniques 3D Positional Audio Design	Audio Design Exercise *Adjusting positional audio and blending volumes*
Week 14	**Micro-Levels** External Gameplay Space Design Overworld to Level Transition Development and Design 3D Special Encounter Architecture	Micro-level Exercise *Large level to smaller gameplay space creation overview*
Week 15	**GOLD MASTER MILESTONE** Final Game Build Post-Mortem process	**FINAL GAME BUILD** **Post-Mortem** *Final executable build of game, along with a detailed post-mortem document*

Evaluation of Grades

Assignment	Total Points	% of Grade
PARTICIPATION *Class attendance and discussion participation*	100	10

Assignment	Total Points	% of Grade
GAME DESIGN DOCUMENT V1.0 *Initial document outlining all aspects of creating a unique 3D game*	50	5
3D ASSETS WITH PBR MATERIAL *Two custom models + materials using diffuse, specular, normal textures*	50	5
UI SCREENSHOT *Render in Unity of the game's 3D user interface components*	50	5
PROTOTYPE MILESTONE ***Executable build of the initial game product state*** ***Updated design document***	100	10
LIGHTING SCREENSHOTS *Two screenshots in-game showcasing lighting, particles, and post-processing effects*	50	5
MIDTERM MILESTONE ***Executable build of the game product demonstrating gameplay and art*** ***Updated design document***	100	10
PRIORITIZED BUG REPORT *Document outlining all known bugs and missing features - prioritized*	50	5
AUXILIARY LEVEL SCREENSHOTS *Two screenshots in-game showing the Game Start and Credits scenes*	50	5
BETA MILESTONE ***Executable build of the content complete game product*** ***Final game design document version***	100	10
MICRO-LEVEL SCREENSHOTS *Two screenshots in-game demonstrating transitionary gameplay scenes*	50	5
FINAL PROJECT (GOLD MASTER MILESTONE) ***Final executable build of the unique 3D game product*** ***Post-mortem evaluation document***	100	25

Grading Scale

Letter Grade	% Equivalency	GPA Equivalency
A	94 – 100%	4.0
A-	90 – 93%	3.67
B+	87 – 89%	3.33
B	84 – 86%	3.00
B-	80 – 83%	2.67
C+	77 – 79%	2.33
C	74 – 76%	2.00
C-	70 – 73%	1.67
D+	67 – 69%	1.33
D	64 – 66%	1.00
D-	60 – 63%	.67
E, I, NG, S-U, WF	0 – 59%	0.00

More information on grades and grading policies is here:

https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Materials and Supply Fees
Material and supply and equipment use fee information is available from the academic departments or from the schedule of courses (Florida Statutes 1009.24). The total course fee for this class is $0.00.

The total course fee for each course is listed on the UF Schedule of Courses. (https://registrar.ufl.edu/soc/).

Course Polices

Attendance Policy, Class Expectations, and Make-Up Policy
We value participation more than mere attendance. The instructor is responsible for communicating the specific details of what percentage of your grade (if any) will be assigned to participation, and how class participation will be measured and graded. Interaction with your peers and the instructor will empower you to greater achievement.

In our course, attendance is taken at the beginning of each class period, and is calculated as the Participation element which makes up 10% of your overall grade. Any unexcused absences are factored into the Participation grade total. Exempt from this policy are only those absences involving university-sponsored events, such as athletics and band, and religious holidays, family emergencies, and health issues for which you must provide appropriate documentation in advance of the absence. All assignments are due by the stated date and time. Late assignments as a result of an unexcused absence may be submitted up to one week after the scheduled due date, incurring a 10% grade penalty.

Additionally, tardiness will not be tolerated. If you are tardy for three class periods, you will receive an unexcused absence.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

Course Technology
The students will be required to have access to and use a personal computer with the access to the Internet. Word editing software will be required for written assignments.

The University of Florida and Digital Worlds requires that students have access to and on-going use of a laptop/mobile computer for DIG courses in order to be able to function in the current learning environment. Digital Worlds requires each student's laptop computer to meet certain minimum specs for heavy graphics use, the requirements documented below must be met.

DW Computer Requirements: http://digitalworlds.ufl.edu/programs/ba-in-digital-arts-sciences/new-student-buyers-guide/

Course Communications
Students can communicate directly with the instructor regarding the course material through the course management system (CANVAS) using "Canvas Mail".

Course Technology Support

The Technology Support Center provides computer support for Digital Worlds students who access Zoom, lecture recordings, student equipment, facilities and other technology-based resources.
http://digitalworlds.ufl.edu/support

For computer assistance related to Zoon, lecture recordings, student equipment, and facilities request please Submit a Help Ticket or email support@digitalworlds.ufl.edu.

For support related to account services, technical consulting, mobile device services, software services, administrative support, application support center, and learning support services, please contact the UF Computing Help Desk available 24 hours a day, 7 days a week at 352-392-4357 or helpdesk@ufl.edu.

UF Policies

University Honesty Policy
UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Class Demeanor
Students are expected to arrive to class on time and behave in a manner that is respectful to the instructor and to fellow students. Please avoid the use of cell phones and restrict eating to outside of the classroom. Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all.

Students Requiring Accommodations
Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Netiquette Communication Courtesy
All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats, more information can be found at: http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see:
http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu/evals. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

Campus Resources

U Matter, We Care:

If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

E-learning Technical Support

352-392-4357 (select option 2) or e-mail to Learning- learning-support@ufl.edu

Career Connections Center

Reitz Union, 392-1601. Career assistance and counseling. https://career.ufl.edu

Library Support

Various ways to receive assistance with respect to using the libraries or finding resources.
http://cms.uflib.ufl.edu/ask

Teaching Center

Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. http://teachingcenter.ufl.edu/

Writing Studio

2215 Turlington Hall, 846-1138. Help brainstorming, formatting, and writing papers.
http://writing.ufl.edu/writing-studio/

Student Complaints Campus
http://regulations.ufl.edu/wp-content/uploads/2012/09/1.0063.pdf

Online Students Complaints
http://www.distance.ufl.edu/student-complaint-process

Disclaimer: This syllabus represents the instructor's current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.