CSCI/CITA 120-01 Animation and Virtual Worlds Syllabus for Fall 2017 College of Charleston

Meetings: MWF 9:30 – 10:20 am in Harbor Walk East 301

Instructor: William Bares,   Office: Room #332 Harbor Walk East

Phone: 843-953-6601,   E-mail: bareswh@cofc.edu,   Class Webpage: lms.cofc.edu

Office Hours: MWF 10:30 – 11:20 am, MW 12:30 – 2 pm, with other hours available by appointment or by open door.

Catalog Course Description: This course allows students to author on-screen movie animations and interactive games while learning the fundamentals of visual storytelling, lighting, and cameras using a 3D animation package. Students will learn to think algorithmically and abstractly while gaining an appreciation for the complexity of building software systems and a skill set for writing elegant code.

Overview

This course introduces fundamental procedural programming concepts using an accessible scripting language Python to create 3D virtual worlds. The scripting language, Python, will be used to create, modify, and animate objects in virtual 3D worlds. The course will cover elements of animated storytelling including story elements, cinematography, and lighting. The course will explore current topics in virtual worlds such as virtual and augmented reality.

Grading:

- Scale: A: 90-100; A- 88-89, B+: 85-87, B: 80-84, B-: 78-79; C+: 75-77; C: 70-74; C-: 68-69; D+: 65-67; D: 60-64; D-: 58-59; F: < 58. Fractional values of 0.5 or higher will be rounded up.
- Final Grade Computation: Homework 25%, In-class exams (3) counting 15% each, Final Project 20%, and Participation 10% (quizzes, in-class activities, algorithm or design sketches, presentations to the class). You can track your progress by logging into our class in OAKS (My Charleston).

Important Dates:

- In-class exam #1 – Friday September 22nd
- In-class exam #2 – Friday October 20th
- Fall break – No class on Monday October 16th
- *Mid-term grades posted – Friday October 20th*
- *Last day to drop with W - Thursday October 26th*
- In-class exam #3 – Friday Nov. 17th
- Thanksgiving Holiday – No classes on Wednesday November 22nd and Friday November 24th
- In-class course evaluation – Wednesday November 29th
- *Storm make up day – Saturday October 7th (9:30 am or 11:30 am)*
- *Last regular class meeting – Monday December 4th*
- *Submit all final project materials – Tuesday December 11th by noon (12 PM EST)*
- *Final project presentations – Wednesday December 13th from 9 – 11 AM (designated exam date)*

Learning Outcomes for CSCI/CITA 120-01 Animation and Virtual Worlds

Given *a concept* to be learned by students, Bloom's Taxonomy identifies six levels of mastery.

Theme	*Subtheme*	*Description*
remember	reproduce	1. **Recall of Data, Knowledge:** Student can recite memorized information about *the concept*.
	explain	2. **Comprehension:** Student can explain memorized information about *the concept* in his own words.
use	reproduce	3. **Application:** Student can demonstrate his comprehension by applying *the concept* as a whole.
	explain	4. **Analysis:** Student can separate *the concept* into its component parts and apply these parts in another situation.
create	reproduce	5. **Synthesis:** Student can design an artifact by combining components of *the concept*.
	explain	6. **Evaluation:** Student can judge *a novel artifact* created by combining components of *the concept*.

Note – After each outcome, a number 1-5 appears to up to which level of Bloom's Taxonomy that outcome will strive. For example, [3] means that students must master levels 1 – 3 for that outcome.

Computing-related learning outcomes

0. To apply the **software development cycle** (problem definition, requirements specification, design, implementation, testing, and repeating this cycle as needed) in program development **[3]**
1. To understand object-oriented relationships of IS-A, HAS-A, and composition using examples from a given 2D or 3D graphics library **[3]**
2. To apply object-oriented concepts of creating instances of objects and accessing their attributes in managing 2D or 3D graphical objects **[5]**
3. To apply **variables** in program development **[3]**
4. To analyze **assignment** (semantics of LHS versus RHS) and apply its components in program development **[4]**
5. To design expressions using **arithmetic operations** (including understanding their limitations, such as integer truncation, round-off error, division by zero, precedence, and standard math library functions) **[5]**
6. To design expressions using **relational operators** (including floating point equality) **[5]**
7. To design expressions using **logical operators** (including short-circuit) **[5]**
8. To design **selection statements** (if, if-else, if-else if) **[5]**
9. To design **repetition statements** (count-controlled loop or conditional loop) **[5]**
10. To design simple data structures using **lists** (including using loops with lists) **[5]**
11. To design **procedures** (formal versus actual parameters, void versus value-returning and when to use which, pre-conditions and post-conditions header comments) **[5]**

Arts-related learning outcomes:

12. Understand how to explore and cite examples of artwork which will serve as inspirational ideas for assignments **[1, 3].**
13. Understand current tools used in creating virtual world content such as virtual reality [1].
14. To understand and apply principles of storytelling including plot, characters, and universal story structures **[2, 3, 4]**
15. To understand parallels between animation and software development in that both involve specifications (define desired product), informal design (in art a storyboard, in computing an algorithm or flowchart), and the iterative improvement and evaluation of artifacts until reaching a final version which satisfies the specifications.
16. To create storyboards to plan animated stories **[3]**
17. To understand and apply 3d modeling techniques (such as polygons, textures, extrusion, grouping, etc.) and knowing when to use each technique **[2, 3, 4]**
18. To understand and apply principles of lighting in telling animated stories **[2, 3, 4]**
19. To understand and apply principles of animation (such as key framing, squash & stretch, etc.) **[2, 3, 4]**
20. To understand and apply principles of cinematography in telling animated stories **[2, 3, 4]**
21. Apply skills of public presentation to pitch or explain your animation or virtual world **[3]**

Texts:

Since this is a unique course that blends introductory programming and 3D animation, there is currently no ideal textbook that covers all course topics. I recommend attending class and keeping good notes.

Optional: Ideas for the Animated Short: Finding and Building Stories 2nd Edition

Optional: Python Programming: An Introduction to Computer Science 2nd Edition

Course Policies:

- **Attendance:** I strongly encourage you to attend all classes. Regardless of actual attendance, you are responsible for announcements made in class, assignment due dates, etc. There will be three in-class tests, attendance at which is mandatory.
- **Excused absences:** If possible let me know in advance for jury duty, military duty, personal/family emergency, or travel with a College team or academic conference. Absences for illness or personal/family emergencies can be reported confidentially to the College. You will be allowed to makeup missed assignments or exams with an excused absence as promptly as is reasonably possible. For example, you can schedule a makeup exam 1-3 days before or after excused travel.
- **How to report an absence:** Students should go to 67 George Street (white house next to Stern Center) to discuss absences and fill out the appropriate forms. Any questions should go directly to either Constance Nelson or get forms online at: http://www.cofc.edu/studentaffairs/general_info/absence. Forms can be faxed to the College at 953-2290. Students will need documentation for health, personal or emergency situations.
- **Assignment Due Dates:** Each assignment is due by the date and time that will be stated on the assignment. Electronic assignments will be accepted only via OAKS. No assignments will be accepted late. The lowest homework and participation grade will be dropped. I highly recommend submitting partial work for all assignments prior to the deadlines. Partial credit will be given.
- **Electronics Devices:** Please refrain from using devices in-class for non-class activities.

- **Different Abilities Accommodation:** Any student who feels that he or she may need an accommodation due to a disability should speak to me individually. For additional help please contact the College of Charleston Center for Disability Services (CDS) in the first floor of the Lightsey Center, Suite 104 at http://www.cofc.edu/~cds/ . Please do so as soon as possible so I may receive confidential notices from the CDS in advance of exams or classwork. This College abides by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act.

College of Charleston Honor Code and Academic Integrity

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception.

My simple way of saying explaining the Honor Code is to complete your tests and assignments by actively understanding the course material and producing your own solution by actively engaging your mind. Computer-based work as in this course makes it possible to short-circuit the mental work required for the active learning process by electronically copying the work of another person. I encourage students to help one another out by teaching classmates the general skills that they can use themselves to solve the problem on their own. Avoid sharing or showing literal computer code assignment solutions, but instead makeup different examples to work out with peers so they understand the general concept so they can apply the skills to produce their own solution.

Incidents where the instructor determines the student's actions are related more to a misunderstanding will handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student's file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XXF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student's transcript for two years after which the student may petition for the XX to be expunged. The F is permanent. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

Students should be aware that unauthorized collaboration--working together without permission-- is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted. On some assignments, you may be allowed to borrow content such as 3D models. You must cite and credit sources when borrowing ideas/content from others. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others' tests or assignment work, fabricating data, and giving unauthorized assistance. Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor.

Students can find the complete Honor Code and all related processes in the *Student Handbook* at   http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php