CSCI/CITA 120
Building Virtual Worlds
(3 hours, no prerequisites)

Instructor:
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Catalog Course Description
This course allows students to author on-screen movie animations and interactive games while
learning the fundamentals of object-oriented programming using a user-friendly environment.
Students will learn to think algorithmically and abstractly while gaining an appreciation of the
complexity of building software systems and a skill set for writing elegant code.

Prerequisites by Topic
Basic computer experience, including file organization and software installation.

Outline of Course Topics
This course has two purposes. First it is designed to teach students many fundamental
programming concepts using a visual language. It allows them to see “objects” thus illustrating
the concepts of object-oriented programming. This visual approach to computing helps prepare
students to take a first course in a text based computer programming class. The outcomes
expected for students as they relate to computer programming are as follows:

- To decompose a problem.
- To solve a problem using simple, step-by-step procedure written in
  pseudocode/storyboards.
- To use numeric data types, variables, parameters, and mathematical, relational and
  logical operators to solve a problem.
- To use basic programming constructs: repetition, selection, methods, and functions.
- To understand object-oriented concepts of information hiding, encapsulation, classes, and
  objects (including their methods).
- To understand events and be able to write event-handling methods.
- To design simple data structures using lists.
Secondly this course will introduce students to elementary theater concepts, and how they can be applied in a 3D programming environment. By the end of the semester, students will be exposed to all, or a reasonably large portion, of the concepts available in the outcomes list as follows:

- To understand the meaning of stage direction terms as it applies to Alice: stage left, stage right, upstage, downstage, in, out, and exit.
- To relate the concept of “form follows function” to program design and implementation.
- To apply the relevant elements of physical, light, and sound design to object-oriented programming.
- To apply the types of sound effects: verbal, non-verbal, and realistic noises.
- To articulate intention for the audience in a specifically created 3D environment.
- To incorporate the elements of design in a 3D programming environment in order to:
  - Establish time and place
  - Establish social and economic status
  - Express metaphor, symbol or allegorical concepts
  - Establish character relationship
  - Visibility
  - Composition
  - Dimensionality
  - Reinforce style
  - Development of the dramatic action
- Additionally, to experience oral presentations of completed work.

Learning Objectives

- Apply theater concepts in the design and implementation of virtual environments
- Utilize lighting, sound and texture in a 3D world to establish atmosphere and mood
- Apply sound effects in a virtual environment
- Use storyboards and scripts as design tools for virtual world programs
- Use variables in program development
- Understand arithmetic operators and use them to design expressions
- Understand “for”-loops and use them to design processes involving repetition
- Understand “if“ statements and use them to design processes involving selection
- Understand functions & methods use them to design processes involving modularization
- Use predefined classes in program development (object-based programming)
- Understand events, event-handling methods, and user interaction in a virtual world
- Learn basic principles for group collaboration

Grading

Scale: A: 90-100; B: 80-89; C: 70-79; D: 60-69; F: <60. The grades of B+/−, C+/−, and D+/− may be given at the professor's discretion.
**Final Grade Computation:** Assignments (6-10) 20%, Tests (3) 30%, Projects (3) 30%, Pecha Kucha Presentation 10%, and Class Participation 10%

**Readings**

**Required Texts**

**Required Software**

**Course Schedule (tentative)**

See OAKS or Course website (munsellb.people.cofc.edu)