

**University of Arkansas – Fort Smith**  
**5210 Grand Avenue**  
**P.O. Box 3649**  
**Fort Smith, AR 72913**  
**479-788-7000**

## **General Syllabus**

### **CS 3143 Game Design and Development**

Credit Hours: 3

Lecture Hours: 3

Laboratory Hours: 0

Prerequisites: CS 2003 Data Structures

Effective Catalog: 2018-2019

#### **I. Course Information**

##### **A. Catalog Description**

Introduction to computer game design theory and application. Topics include game design methodology, architectures, computer graphics, game mechanics, and artificial intelligence.

##### **B. Additional Course Information**

This course is used to satisfy the requirements for the Programming Concentration in the Information Technology degree. It may also be used as an upper level elective in all other concentrations of the IT degree.

#### **II. Student Learning Outcomes**

##### **A. Subject Matter**

Upon successful completion of this course, the student will be able to:

1. Explain the principles of game design and development.
2. Explain and incorporate principles and application of physics, graphics, and artificial intelligence in the game design process.
3. Evaluate and assess the use of programming and scripting languages in game development.
4. Evaluate relevant APIs to utilize pre-existing game engines.
5. Demonstrate an understanding of concepts, techniques, and methodology associated with the computer gaming industry.
6. Collaborate in and contribute to a team-based software development project that requires the student to design, implement, test, and document program solutions and incorporate them with other team members' solutions to complete the overall project.

## **B. University Learning Outcomes**

This course enhances student abilities in the following areas:

### **Analytical Skills**

**Critical Thinking Skills:** Students will analyze and create a computer game based on design specifications and develop and implement the solution.

**Quantitative Reasoning:** Students will develop algorithms for solving mathematical problems within the games.

## **III. Major Course Topics**

- A. History of computer and video gaming
- B. Game genres
- C. Influence of games and society
- D. Game design
- E. Game development architectures
- F. Mathematics and physics for games
- G. Collision detection
- H. Game graphics and animation
- I. Game artificial intelligence
- J. Audio visual design and production
- K. Game production and management