1. Course number and name: CSCI 4439 Game Programming

2. Credits and contact hours: 3 credit, 3 contact

3. Instructor’s or course coordinator’s name: James Harris, PhD

   a. Other supplemental materials: None

5. Specific course information
   a. Brief description of the content of the course (Catalog Description)
   An introduction to game design and development including game physics, using game engines, using AI in games, creating multi-threaded games, and creating networked games
   b. Prerequisites: A minimum grade of “C” in CSCI 1302
   c. Indicate whether a required, elective, or selected elective course in the program
      Elective course for BS-CS.

6. Specific goals for the course
   a. Specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.

<table>
<thead>
<tr>
<th>Course Learning Outcomes</th>
<th>Student Outcomes</th>
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</thead>
<tbody>
<tr>
<td>Identify and choose appropriate algorithmic, programming, and mathematical techniques to develop software components for various aspects of computer games, such as character control, scene management, artificial intelligence, graphics and animation, etc.</td>
<td>1i, 2a</td>
</tr>
<tr>
<td>Build systems that employ common approaches to game AI, game physics, game networking, game graphics, operating systems, and file formats.</td>
<td>1c, 1i, 2a</td>
</tr>
<tr>
<td>Evaluate and select appropriate hardware and software platforms for a particular game strategy.</td>
<td>1i, 2a</td>
</tr>
<tr>
<td>Test, debug, and optimize a game or game component to meet requirements.</td>
<td>1c, 1i, 2a</td>
</tr>
</tbody>
</table>

b. Student Outcomes:
• 1c: An ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs
• 1i: An ability to use current techniques, skills, and tools necessary for computing practice
• 2a: An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices

7. **Brief list of topics to be covered**
   - Visual Studio 2008 and C#
   - XNA
   - 2-D Graphics
   - Collision Detection
   - 3D Graphics
   - Animation
   - Textures
   - Index Buffers
   - #D Modeling
   - Linear Algebra
   - Wire Frames
   - Light Sources
   - Hidden Shapes
   - Terrain
   - Audio Effects
   - Networking Concept