Computational Thinking in Context: Game Development

CSE 1213

Credit Hours:
4.00

Course Coordinator:

Course Length:
14 weeks (autumn or spring)

Representative Textbooks and Other Course Materials:

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Custom video tutorials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-line books, tutorials and other resources</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Course Description:
Introduction to computational thinking, focusing on problem solving and programming concepts and skills needed to develop video games.

Designation:
Elective

Course Goals / Objectives:
Be competent with using basic constructs provided by high-level imperative programming languages: sequencing, selection, and iteration.
Be familiar with algorithmic thinking.
Be familiar with using basic data structure interfaces such as arrays or lists in simple programs.
Be familiar with procedural composition.
Be exposed to procedural abstraction by defining new blocks
Be familiar with basic terminology, software architecture and concepts of video game development.
Understand the basic frame loop, sprite movement and graphics of 2D games.
### ABET-CAC Criterion 3 Outcomes:

No outcome selected

### ABET-EAC Criterion 3 Outcomes:

<table>
<thead>
<tr>
<th>Substantial contribution (3-6 hours)</th>
<th>1</th>
<th>an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substantial contribution (3-6 hours)</td>
<td>2</td>
<td>an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors</td>
</tr>
<tr>
<td>Some contribution (1-2 hours)</td>
<td>3</td>
<td>an ability to communicate effectively with a range of audiences - pre-2019 EAC SLO (g)</td>
</tr>
<tr>
<td>Some contribution (1-2 hours)</td>
<td>4</td>
<td>an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts</td>
</tr>
<tr>
<td>Substantial contribution (3-6 hours)</td>
<td>5</td>
<td>an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives</td>
</tr>
<tr>
<td>Some contribution (1-2 hours)</td>
<td>7</td>
<td>an ability to acquire and apply new knowledge as needed, using appropriate learning strategies</td>
</tr>
</tbody>
</table>
### Course Topics:

- Basic concepts of video games
- Introduction to programming for web-based games
- Loops, new definitions, simple controls
- Conditionals, Boolean expressions, advanced controls
- Nested loops, complex control structures
- Sprites, sprite sheets, image and canonical coordinates
- Course project: Breakout game
- Classes and objects
- Course project: 2D scroller