Computational Thinking in Context: Images, Animation, and Games

CSE 1211

Credit Hours:
3.00

Course Levels:
Undergraduate (1000-5000 level)

Course Components:
Lecture
Lab

Course Description:
Introduction to computational thinking, focusing on problem solving and programming concepts and skills needed to manipulate digital images and to create interactive graphics, animations, and games; creativity and imagination encouraged.

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 simple media manipulation algorithms and how to apply them to solve interesting media manipulation problems
- Be familiar with using basic data structure interfaces such as arrays or lists in simple programs
- Be familiar with procedural composition
- Be familiar with many of the possibilities available for creative combination in programmed interactive animations
- Be familiar with working in a window-based computing environment
- Be familiar with using a modern interactive program development environment
- Be exposed to the virtual machine model of modern computer systems
**Course Topics:**
- Software installation, and basic concepts
- Introduction to programming with media, images, colors, encodings
- Loops, new definitions, simple image manipulations
- Nested loops, conditionals, Boolean expressions, advanced image manipulations
- Animation via sprite movement using iteration
- Sequencing, iteration, and drawing
- Selection and collision detection and polled input for user interaction
- Managing sprite velocities
- Discussion and evaluation of preliminary ideas
- Discussion of problems encountered and possible solutions
- Presentation and evaluation of final projects

**Designation:**
Elective