SECTION I

SUBJECT AREA AND COURSE NUMBER: CSC 247
COURSE TITLE: Game Development with C++
COURSE CATALOG DESCRIPTION:

This course will introduce the student to basic computer game design and game components such as sprites, backgrounds, 2D graphics and tiling. Different types of games including multi-level and multi-player games will be explored. Students will add sound to the games and learn how to save game settings between sessions. The use of programming logic and artificial intelligence in game design and development will be introduced. This will be a project-based, hands-on class using the Allegro game library with the C++ programming language.

LECTURE HOURS PER WEEK: 3   **CREDIT HOURS:** 3
LAB HOURS PER WEEK (if applicable): n/a
PREREQUISITE(S): CSA 105 or CSC 101

SECTION II

A. SCOPE:

This course will use C++ and the Allegro file library to create and manipulate computer programs with an emphasis on game design. Topics covered include: game development techniques, using pre-built functions to enhance programs, two-dimensional graphics, designing a game interface for mouse, keyboard, and joystick, sprites, backgrounds, tiles, different types of game programs, bitmaps, sprites, tiles, tile based backgrounds , interrupt handlers, multi-treading, using sound in games, setting up and storing game resources, and artificial intelligence.

B. REQUIRED WORK:

Work varies by instructor. Students will be expected to do all required readings, assignments, tests, and quizzes as outlined by their instructor.

C. ATTENDANCE AND PARTICIPATION:

Regular attendance, assignment submission timeliness, promptness and class/lab participation will be expected. Instructors will include specific attendance and participation policies requirements in their class syllabi.

D. METHODS OF INSTRUCTION:

Methods may include any of the following: lecture, lecture/discussion, small group, collaborative learning, experimental/exploration, distance learning, student presentations, computer demonstrations, or use of technologies such as audio-visual materials, and computer laboratory equipment. Emphasis will be on hands-on computer exercises and problems.

E. OBJECTIVES, OUTCOMES, and ASSESSMENT

Students' grades will be based on achievement of learning the objectives and outcomes listed below as measured by the instructor's methods of assessment:

LEARNING OBJECTIVES	LEARNING OUTCOMES	ASSESSMENT METHODS
To demonstrate an understanding of:	Student will:	As measured by:
Basic processes used in game development	a) Install and configure the C++ compiler b) Install and configure the Allegro file library	• Homework/Lab assignments; • Written and Oral activities; • Quizzes and Exams; • Online Computer Exercises; • Programming Projects and Presentations
Interactions between C++ and Allegro game library in game creation	a) Create a simple program with the compiler and library	• Homework/Lab assignments; • Written and Oral activities; • Quizzes and Exams; • Online Computer Exercises; • Programming Projects and Presentations
Two dimensional Graphics	a) Create two dimensional graphics b) Create graphics primitives c) Print text onto the screen	• Homework/Lab assignments; • Written and Oral activities; • Quizzes and Exams; • Online Computer Exercises; • Programming Projects and Presentations
Basic concepts used in game design	a) Create a game development plan b) Evaluate and report on existing game design plans c) Create a design document	• Homework/Lab assignments; • Written and Oral activities; • Quizzes and Exams; • Online Computer Exercises; • Programming Projects and Presentations
Basic game types	a) Evaluate and report on multi level games b) Evaluate and report on RPG games c) Evaluate and report on Platform games d) Evaluate and report on first person shooter games	• Homework/Lab assignments; • Written and Oral activities; • Quizzes and Exams; • Online Computer Exercises; • Programming Projects and Presentations
Bitmap handling and blitting to create 2D graphics	a) Create simple bitmaps b) Design simple 2D images using bitmaps	• Homework/Lab assignments; • Written and Oral activities; • Quizzes and Exams; • Online Computer Exercises; • Programming Projects and Presentations
Simple and advanced sprites	a) Create sprites b) Animate sprites c) Detect collisions using sprites	• Homework/Lab assignments; • Written and Oral activities; • Quizzes and Exams; • Online Computer Exercises; • Programming Projects and

		Presentations

Tile-based backgrounds	a) Create backgrounds b) Implement created background in simple games c) Scroll backgrounds to give the illusion of motion	• Homework/Lab assignments; • Written and Oral activities; • Quizzes and Exams; • Online Computer Exercises; • Programming Projects and Presentations
Timers, interrupt handlers and multi-threading in game development	a) Add timers, interrupt handlers, and multi threading to previously created projects	• Homework/Lab assignments; • Written and Oral activities; • Quizzes and Exams; • Online Computer Exercises; • Programming Projects and Presentations
Sound integration in game design	a) Create sound initialization routines b) Create low level sample playback routines	• Homework/Lab assignments; • Written and Oral activities; • Quizzes and Exams; • Online Computer Exercises; • Programming Projects and Presentations
Storage of game resources	a) Create data files to store game resources b) Access data files to use resources in a game program	• Homework/Lab assignments; • Written and Oral activities; • Quizzes and Exams; • Online Computer Exercises; • Programming Projects and Presentations
Applications of principles from artificial intelligence and programming logic in the design and development of games	a) Create simple artificial intelligence for a game. b) Create different levels of difficulty which utilize different Artificial intelligence routines	• Homework/Lab assignments; • Written and Oral activities; • Quizzes and Exams; • Online Computer Exercises; • Programming Projects and Presentations

F. TEXT(S) AND MATERIALS:
Recommended Text: Game Programming All in One, 2nd Edition
Author: Jonathan S. Harbour
Publisher: Thompson / Course Technology

G. INFORMATION TECHNOLOGY:
This course is an information technology course and will require extensive computer lab time both for teaching and performing assignments. Students will require network accounts with access to a C++ compiler, a file library called Allegro, as well as file storage space.