



蘇州大學  
Soochow University

# CS 474 Introduction to Game Programming

Summer 2024

**Course Credits:** 4

**Contact Hours:** 56 hours

**Instructor:** TBA

**Email:** TBA

## COURSE OBJECTIVES

This course will provide a high-level look at the programming of games by introducing some useful skills with computer techniques, such as the C++ language. The primary goal of this course is to offer a basic understanding of the programming requirements for games, including the basic concepts of the game loop, game time, game objects, and linear algebra, which are closely linked to the development and implementation of a programming game. Some focus will be given to the practices of 2D and 3D game creations to offer the students a deeper comprehension of the game programming process.

Upon completion of this course, students will be able to:

1. Comprehend fundamental game programming concepts, including game loop, game time, game objects.
2. Gain a deep understanding of linear algebra, including vectors and matrices.
3. Apply the concepts of physics in game programming throughout the game programming process, including basic movements, collision geometry and detection.
4. Design and develop programming 2D games with an application of rendering foundation, sprites, scrolling, and tile maps.
5. Design and develop programming 3D games with an application of basic rendering, coordinate spaces, lighting and shading, and visibility.

## PREREQUISITES

CS 276 Introduction to Computational Programming



## GRADING

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Grades will be determined by accumulating points, with 100 points being the maximum, as follows:

ITEM	POINTS
Assignments	20 Points
Quizzes	20 Points
Group Project	30 Points
Final Project & Presentation	30 Points
Total	100 Points

Late submissions will be graded at the end of the course. Grades will be assigned according to the following rule:

$$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F.$$

We reserve the right to make adjustments to the overall grading policy.

## COURSE MATERIALS

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### Required Texts:

Sanjay Madhav, *Game Programming Algorithms and Techniques : A Platform-agnostic Approach*, 1st Edition, Addison Wesley, 2014.

### Recommended (Optional) Texts or Other Materials:

None

## COURSE TOPICS

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MODULE	TASKS
Module 1	<b>Topics:</b> Topic 1: Introduction to Game Programming Topic 2: History of Game Programming Development Topic 3: Overview of Game Loop Topic 4: Understanding game time and objects <b>Assessments:</b> Quiz#1



Module 2	<b>Topics:</b> Topic 5: Introduction to Linear Algebra for Games Topic 6: Vectors and Matrices Topic 7: Input devices and system Topic 8: Basic Sound <b>Assessments:</b> Quiz#2 Assignment#1
Module 3	<b>Topics:</b> Topic 9: Planes, Rays, and Line Segments Topic 10: Collision Geometry and Detection Topic 11: Physics-Based Movement Topic 12: Physics Middleware <b>Assessments:</b> Assignment#2
Module 4	<b>Topics:</b> Topic 13: 2D Rendering Foundation Topic 14: Sprites Topic 15: Scrolling Topic 16: Tile Maps <b>Assessments:</b> Group Project
Module 5	<b>Topics:</b> Topic 17: 3D Rendering Basics Topic 18: Coordinate Spaces, Lighting and Shading, Visibility Topic 19: Idea Sharing and Group Collaboration Topic 20: Final Project Presentations and Reflections <b>Assessments:</b> Final Project & Presentation

## ATTENDANCE

1) Class attendance is required. Missing classes without permission will lead to decrease in overall grade.

Missing less than two classes: no penalty.

Missing more than two classes: 7% will be taken off from the overall grade.

If the instructor reports a student's frequent missing of class to the Soochow University Academic Administration Office, the student might get a written warning and might be prohibited from attending final exam.



2) Participants in this course are expected to arrive in class promptly and adequately prepared. The primary objective of this course is to critically engage with the readings and the subject matter. Therefore, course participants are expected to have completed the reading prior to class and prepare thoughtful reflections/commentaries to share with fellow colleagues.

### **LEARNING REQUIREMENTS**

- 1) Late assignments are not acceptable and are subjected to grade deductions.
- 2) Assignments submitted in the wrong format will be counted as not submitted.
- 3) Failure to submit or fulfill any required course component results in failure of the class.
- 4) Make-up for midterm and final exams only with valid excuses, as defined by the University.
- 5) In order to earn a Certificate of Completion, participants must thoughtfully complete all assignments by stated deadlines and earn an average quiz score of 50% or greater.

### **TECHNOLOGY POLICY**

The use of electronic devices in class is distracting, both for the user and for the rest of the class. Only non-programmable calculators can be used in the tests and exam. Any attempts to use cell phones and other electronic communication devices will be seemed as cheating. Laptops are discouraged, unless you use them for activities DIRECTLY related to the course (eg., note taking, reading course documents).

### **ACADEMIC INTEGRITY POLICY**

Soochow University highly values the academic integrity and aims to promote the academic fairness, honesty and responsibility. Any academic dishonesty behaviors and any attempts to cheats and plagiarism will be reported to the university administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.

### **DISABILITY ACCOMMODATION**



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Soochow University is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at Soochow University. Students with disabilities who require accommodations for access to and/or participation in this course are welcome.

Note:

Please contact the University Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.