CSC 165: GAME AND GAME ENGINE ARCHITECTURE

In Workflow

1. CSC Committee Chair (abeer.abdelkhaleq@csus.edu)
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Approval Path

1. 2026-09-15T21:59:17Z
   Abeer Abdel Khaleq (abeer.abdelkhaleq): Approved for CSC Committee Chair
2. 2026-09-15T22:15:13Z
   Jinsong Ouyang (jouyang): Approved for CSC Chair
3. 2026-10-02T17:01:44Z
   Tongren Zhu (tongren.zhu): Approved for ECS College Committee Chair
4. 2026-10-02T17:51:03Z
   Behnam Arad (arad): Approved for ECS Dean

Date Submitted: 2026-09-14T22:21:25Z

Viewing: CSC 165 : Game and Game Engine Architecture

Last edit: 2026-09-30T19:58:38Z

Changes proposed by: V Gordon (101052142)

Contact(s):

Name (First Last)	Email	Phone 999-999-9999
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Catalog Title:
Game and Game Engine Architecture

Class Schedule Title:
Game+GameEngineArchitecture

Academic Group: (College)
ECS - Engineering & Computer Science

Academic Organization: (Department)
Computer Science

Will this course be offered through the College of Continuing Education (CCE)?
No

Catalog Year Effective:
Fall 2027 (2027/2028 Catalog)

Subject Area: (prefix)
CSC - Computer Science

Catalog Number: (course number)
165

Course ID: (For administrative use only.)
191807

Units:
3

Is the ONLY purpose of this change to update the term typically offered or the enforcement of existing requisites at registration?
No

In what term(s) will this course typically be offered?
Spring term only

Does this course require a room for its final exam?
Yes, final exam requires a room

This course complies with the credit hour policy:
Yes

Justification for course proposal:
By making CSc-155 a prerequisite, this enables CSc-165 to dive more deeply into the inner workings of complex game engines, since engines make heavy use of shader programming. This greatly enriches the course outcomes. This wasn't feasible previously because the prerequisites to CSc-155 made it very difficult for students to complete it early enough in their degree progress. The department has made significant revisions to the structure of its graphics courses, and has reduced the prerequisites to CSc-155 (Shader Programming) to enable students to take it earlier in their progress to degree. So, now it is reasonable to expect CSc-155 as a prerequisite to CSc-165.

Course Description: (Not to exceed 90 words and language should conform to catalog copy.)
Architecture and implementation of computer games and game engines. Elements of game engines such as object and scenegraph management, renderer utilizing a modern 3D graphics rasterization pipeline, scenegraph, camera control, input device handling, viewports, node controllers, HUDs, skyboxes, terrain, physics and collision detection, sound and music. Game implementation details such as modeling tools, game AI for non-player characters, and network protocols for multiplayer games. Substantial programming and project work.

Are one or more field trips required with this course?
No

Fee Course?
No

Is this course designated as Service Learning?
No

Is this course designated as Curricular Community Engaged Learning?
No

Does this course require safety training?
No

Does this course require personal protective equipment (PPE)?
No

Does this course have prerequisites?
Yes

Prerequisite:
CSC 155; MATH 26A or MATH 30; PHYS 5A or PHYS 11A.

Prerequisites Enforced at Registration?
Yes

Does this course have corequisites?
No

Graded:
Letter

Approval required for enrollment?
No Approval Required

Course Component(s) and Classification(s):
Lecture

Lecture Classification
CS#02 - Lecture/Discussion (K-factor=1WTU per unit)
Lecture Units
3

Is this a paired course?
No

Is this course crosslisted?
No

Can this course be repeated for credit?
No

Can the course be taken for credit more than once during the same term?
No

Description of the Expected Learning Outcomes and Assessment Strategies:

List the Expected Learning Outcomes and their accompanying Assessment Strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers). Click the plus sign to add a new row.

	Expected Learning Outcome	Assessment Strategies
1	Explain and extend the organization and implementation of the essential components of a game engine, including scenegraph management, rendering, camera control, etc.	examinations
2	Incorporate 3D models generated via modeling software into a game	examinations, programming projects
3	Use 3D sound as an asset in a game	examinations, programming projects
4	Apply simple physics in a game, such as for collision detection	examinations, programming projects
5	Apply artificial intelligence techniques for controlling non-player characters in a game	examinations, programming projects
6	Show how the 3D graphics pipeline is utilized in computer games	examinations
7	Develop a simple networked multi-player game using a simple game engine	programming projects

Attach a list of the required/recommended course readings and activities:
165readings.pdf

Is this course required in a degree program (major, minor, graduate degree, certificate?)
No

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer)?
No

Will there be any departments affected by this proposed course?
No

I/we as the author(s) of this course proposal agree to provide a new or updated accessibility checklist to the Dean's office prior to the semester when this course is taught utilizing the changes proposed here.
I/we agree

University Learning Goals

Undergraduate Learning Goals:

Competence in the disciplines
Intellectual and practical skills

Is this course required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?

No

Is this a General Education (GE) or Graduation Requirement (GR) course or is it being considered for GE/GR?

Is this a General Education (GE) course or is it being considered for GE?

No

Please attach any additional files not requested above:

CSC165syllabusREVISED.pdf

Key: 1054