CAP 4056 Game Design and Development 2

Course Information

- **Course Number and Title**: CAP 4056 Game Design and Development 2
- Section: 1
- **Credit Hours:** 3 (3 Lecture/0 Lab)
- Current Academic Term: Spring 2026

Instructor Information

- **Instructor**:   Dr. Bradford A. Towle Jr.
- **Office**:   ARC 2230
- **Office Hours**:   M,W,F 11-12:45
- **Office Phone**:   1-863-874-8529
- **E-mail**: btowle@floridapoly.edu
- Class Meeting Day, Time & Location:
    - M,W,F 2:00 pm to 2:50 pm
    - Location: IST-1032

Course Delivery and Course Description

- **Delivery Mode**: Will meet three times a week. Attendance is mandatory.
- **Course Website**:
- Official Catalog Course Description:
- This course builds on top of COP 4052 (Game Design and Development I). It is a hands-on, group- and project-based course. Students will use the Unity game engine to study the in-depth technical requirements for game design. Best practice for designing the software will also be emphasized. The focus of this course will be mainly on the technical aspects of game development with non-trivial programming projects employing different computer interaction technologies and digital media sources.
- Course Pre and/or Co-Requisites:
- Prerequisite CAP 4052
- Communication/Computation Skills Requirement (6A-10.030) N
- Required Texts:
- Tristen, Ben, Mike Geig. Sams Teach Yourself Unity Game Development third (2018 version) edition. Indianapolis: SAMS, 2016. Print. (Or latest version)
- Equipment and Materials:
- You will need a computer that can run Unity 2020.3 or higher.

Course Objectives and Outcomes

- **Course Objectives**:
- To understand how to build a network engine.
- Use a network engine to create a synchronized game played over multiple computers.
- Build teamwork.
- Practice proper techniques for design in game construction.

- **Course Learning Outcomes**:

Learning Outcomes of Instruction:	Learning Levels	ABET Criteria:
Design a network engine that allows games to be synchronized over multiple computers with authoritarian server architecture.	Understand -This is the first encounter most students will have with this material.	(1) Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
Develop a game that maintains synchronization with between computers for all critical states.	Create	(2) Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
Develop a game that has all players start synchronously	Create	- (2) Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
Demonstrate ability to collaborate in interdisciplinary teams, students will develop their skills in communication, team-based production, and project management	Evaluate	(5) Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
Assess both project outcomes and processes.	Evaluate	(5) Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

Academic Support Resources

- **Library**: Students can access the Florida Polytechnic University Library through the University website and Canvas, on and off campus. Students may direct questions to library@floridapoly.edu.
- **Peer Learning Strategists (PLS)**: Are specially trained student leaders who help their peers strategize approaches to course content and work through solution methods. PLS work in collaboration with the courses they support so the content and methods are aligned with your instructors' expectations. Students can meet with a PLS in The Learning Center, which is located on the first floor of the Innovation, Science and Technology (IST) building in room 1019.
- **Academic Success Coaches**: All students at Florida Poly are assigned an Academic Success Coach. Your Academic Success Coach can assist you with academic success strategies. Please visit the Student Success Center on the second floor of the IST building to meet with an Academic Success Coach.
- **Writing Center**: Located on the second floor of the IST (2059/2061), the Writing Center helps students to develop their writing and presentation skills. Consultations are available in person and virtually. For more detail, visit https://floridapoly.edu/writingcenter.

Civility and Collegiality

Faculty and students come to the university for the same reason, which is to participate in a highly professional educational environment. To that end, both students and faculty are expected to treat each other with mutual regard and civility. Communication, written, oral and behavioral, between faculty and students must remain respectful. Within and outside of the classroom, students must refrain from derogatory comments toward the faculty member and their fellow students, and faculty as well must refrain from derogatory comments toward their students. Faculty and students should address each other with respect, in accordance with the wishes of the faculty and the students: for example, no one should be addressed by their last name alone.

Faculty from the outset of a course can and should specify what constitutes activities and behavior that take away from, that diminish, the educational environment. An individual student's distracting behavior impedes the education of fellow students, which itself is a form of disrespect. Civility and collegiality also include respecting

each other's time: for example, neither students nor faculty should arrive late to class (unless unforeseen, pressing circumstances prevail); faculty should be present at the posted office hours; and students and faculty should be punctual when meeting times are scheduled. In more general terms, collegiality means respecting the right of both faculty and students to participate fully and fairly in the educational enterprise.

Course Policies

Attendance
- Students are expected to attend class and participate in the Game Jam as well as the Spring Game Expo.

Participation
Students are expected to participate in the classroom experience. The use of earbuds/headphones during class is specifically not allowed and students who engage in this behavior may be asked to leave the class for the day (noting exceptions for authorized accommodations). In addition, students who routinely do not bring materials to class that are required for participation, will not be given credit for class attendance, and if this becomes a pattern of behavior, may be asked to leave the class for the day. Persistent problems with participation may result in a code of conduct referral.

Late Work/Make-up work
- I do NOT accept late homework, but I do believe in partial credit. Turn in what you have!

Grading Scale

≥ 93.00 A	73.00 - 76.99 C
90.00 – 93 A-	70.00 - 73 C-
87.00 - 89.99 B+	67.00 - 69.99 D+
83.00 - 86.99 B	63.00 - 66.99 D
80.00 - 83 B-	60.00 - 63 D
77.00 - 79.99 C+	< 59.99 F

Assignment/Evaluation Methods
- Knowledge will be tested by demoing projects, quizzes and exams.
  - Professionalism, Participation   10%
  - Projects/Assignments   30%
  - Quizzes   10%
  - Final Project   30%
  - Midterm   20%

    _____
  - Total   100%

University Policies

Reasonable Accommodations
The University is committed to ensuring equal access to all educational opportunities. The University, through the Office of Disability Services (ODS), facilitates reasonable accommodations for students with disabilities and documented eligibility. It is the student's responsibility to self-identify as a student with disabilities and register with ODS to request accommodations.

If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course through the ODS student portal and communicate with your instructor about your approved

accommodations as soon as possible. Arrangements for testing accommodations must be made in advance. Accommodations are not retroactive.

If you are not registered with ODS but believe you have a temporary health condition or permanent disability requiring an accommodation, please contact ODS as soon as possible.

> The Office of Disability Services (ODS):
> DisabilityServices@floridapoly.edu
> (863) 874-8770
> The Access Point
> ODS website: www.floridapoly.edy/disability

Accommodations for Religious Observances, Practices and Beliefs

The University will reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. (See University Policy.)

Title IX

Florida Polytechnic University is committed to ensuring a safe, productive learning environment on our campus that prohibits sex discrimination and sexual misconduct, including sexual harassment, sexual assault, dating violence, domestic violence and stalking. Resources are available if you or someone you know needs assistance. You may speak to your professor, but your professors have an obligation to report the incident to the Title IX Coordinator. Please know, however, that your information will be kept private to the greatest extent possible. You will not be required to share your experience. If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the Florida Polytechnic University Ombuds Office, BayCare's Student Assistance Program, 1-800-878-5470 and locally within the community at Peace River Center, 863-413-2707 (24-hour hotline) or 863-413-2708 to schedule an appointment. The Title IX Coordinator is available for any questions to discussion resources and options available.

Academic Integrity

The faculty and administration take academic integrity very seriously. Violations of academic integrity regulation include actions such as cheating, plagiarism, use of unauthorized resources (including but not limited to use of Artificial Intelligence tools), illegal use of intellectual property, and inappropriately aiding other students. Such actions undermine the central mission of the university and negatively impact the value of your Florida Poly degree. Suspected violations will be fully investigated, possibly resulting in an academic integrity hearing and sanctions against the accused student if found in violation. Sanctions range from receiving a zero on the exam or assignment, to expulsion from the university. Repeat offenders are subject to more severe sanctions and penalties.

Any "special" instructions that are appropriate for academic integrity and the course should go here.
(It is essential that a heading and a statement on what constitutes, includes, academic integrity be included in the syllabus, and that the students be made aware of academic integrity at the beginning of a course.)

Recording Lectures

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use. Recordings may not be used as a substitute for class participation or class attendance. Recordings may not be published or shared in any way, either intentionally or accidently, without the written consent of the faculty member. Failure to adhere to these requirements is a violation of state law (subject to civil penalty) and the student code of conduct (subject to disciplinary action).

*Recording class activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers is **prohibited**.*

Course Schedule

Week	Topic Schedule*	Out of class student work*
Week 1	Networking a Game	Practice Quiz Quiz
Week 2	The Generic Core Sockets Connection Tracking Threads and Unity	Practice Quiz Quiz
Week 3	Network Core Game Object Tracking Spawn Prefab Array Creating and Destroying Game Objects	Practice Quiz Quiz
Week 4	Network Identification Identifying Objects Networked Objects Already in the Scene	Practice Quiz Quiz
Week 5	Network Component Using Abstraction IsDirty Network Start Slow Update Handle Message	Practice Quiz Quiz
Week 6	Using Our Game Engine Synchronizing a variable Synchronizing an object	Tutorial In-Class Lab: Chat Bubble
Week 7	Network Movement Network Transforms Network Rigid body Network Player Controllers	Tutorial In-Class Lab: Nav-Mesh 2.0
Week 8	Optimization Axis-Event Controller Animation	Tutorial In-Class Lab: Mega What?
Week 9	Midterm Project	To be Determined!
Week 10	Starting the Game	Tutorial In-Class Lab: More Options
Week 11	Starting the Game	Tutorial In-Class Lab: Mega What?
Week 12	Creating your own MMO	Tutorial In-Class Lab: Demo Tutorial
Week 13	Evaluating Design	Critique Design (H) (Participation) Dev-Log Game Mechanic Level Design
Week 14	Implementation	Work on final project Prototype Software Engineering Dev-Log
Week 15	Final Preparation for the Game Expo	Dev-Log Presentations Game Expo
Week 16	Test and Demo	Demo final project (C) (Demo Grade Participation)
Final	Final Presentations	

*Subject to change.

- **Project Grading**

All projects and in-class labs will be demoed to the instructor during or immediately after the class. Arrangements can be made for special circumstances. Each project will have a rubric that will be used for the grade. Below is an example rubric:

4 Grading Rubric

	Perfect	Logic Errors	Syntax Errors/Not functional
Only local player can see their input bar	5	2	0
All clients can see the last message posted	5	2	0
Players cannot alter other's messages	5	2	0
Clients that join late will get the most up-to-date message.	5	2	0
Total	/20		