# **GAT240: Technology for Designers**

# Spring 2013

**Prerequisites:** CS 225 or CS 176, PHY 200 or PHY 116

**Schedule:** Tuesday & Thursday 2:00pm—3:20pm

**Classroom:** MICHELANGELO

**Professors:** Chris Peters

**Contact:** [cpeters@digipen.edu](mailto:cpeters@digipen.edu)

**Class Web Page:** The **GAT240** course at [distance.digipen.edu](http://distance.digipen.edu) (join **GameCentral** as well).

**Office Hours:** Tuesday & Thursday 3:30pm—5:00pm

**Description**

This course is a survey of the technologies and concepts commonly used in game development. Topics include game engines, object oriented programming, game editors, lighting, shaders, art pipelines, networking, databases, physics engines, audio, and artificial intelligence. These topics will be covered only at a basic level—enough to be able to use them as a designer, but not enough to be able to implement them. The primary course work and focus for this class is the design and implementation of four basic gameplay prototypes. These prototypes are designed to cover all the game programming and knowledge necessary to build games in modern game engines.

**Course Objectives and Learning Outcomes**

After completing this course, students will have learned how to use technical tools such as game engine editors, scripting languages to program basic game systems. Finally, students will learn how game-engine architecture works, including how to manipulate parameters in game objects, physics systems, etc.

**Textbooks**

There are no required books for this class.

**Optional Textbooks**

There are no optional books for this class.

**References**

The optional books listed above are a good starting point for a beginning game developer, but there are many more books, websites, and other resources that can be extremely useful for anyone making a game or simulation. You can find the current list of recommended resources on the **GameCentral** page.

**Outline and Tentative Dates**

This class will roughly follow the outline below, although the order and/or content of the lectures are subject to change. The deadlines will only be changed in unexpected circumstances (and will never be moved earlier).

**Week 1**

**Lectures:** Introduction to game engines, Basics of object oriented programming and Component-Based Architecture

**Week 2**

**Lectures:** Archetypes, Properties, Events, and Data Driven Design

**Week 3**

**Lectures:** Basic Programming, Properties, High Level Languages

**Week 4**

**Lectures:** Probability and Randomness, Writing Scripts

**Assignment 1 Due:**  RPG

**Week 5**

**Lectures:** Vector Math and Rotations , Real-time Programming

**Week 6**

**Lectures:** Collision Basics, Basic Dynamics

**Week 7**

**Lectures:** Sprites, Textures, 2D Rendering

**Assignment 2 Due:**  Shooter

**Week 8**

**Lectures:** Character Controllers, Inputs Systems

**Week 9**

**Lectures:** Manipulating Physics Parameters, Using a Physics Engine in Code

**Week 10**

**Lectures:** Sound , Ai

**Week 11**

**Lectures:** Lighting, Materials

**Assignment 3 Due:**  Platformer

**Week 12**

**Lectures:** Animation, State Machines

**Week 13**

**Lectures:** Networking, Resource Systems

**Week 14**

**Lectures:** Animation, Data Files

**Assignment 4 Due:**  Polished Game

**Week 15 FINALS WEEK**

This class has no finals.

**Grading Policy**

The grades for this class are determined by how well you do on the various assignments, as follows:

**Assignment 1:** RPG (25%) – Basic Combat programming and data driven design

**Assignment 2:** Shooter (25%) – Adding procedural elements and better AI

**Assignment 3:** Platformer (25%) – Basic platformer physics and physical gameplay

**Assignment 4:** Polished Game(25%) – Polished menus around a basic game

**Mechanisms and Procedures**

There are a variety of procedures and mechanisms used in this class to make it run as smoothly as possible. Make sure you read each of these sections thoroughly so that you understand what the instructors expect.

**Instructor Questions and Meetings**

You will undoubtedly have many questions for the instructors. To make this work efficiently, you must email any questions (about any topics you wish) or meeting requests to one of the instructors. Make sure you start the subject of the email with “GAT240:” so that it won’t be filtered out (failure to do so will result in unanswered emails—note that it must be capitalized and have no spaces or dashes).

In addition to asking questions through email, if you talk with an instructor in person (whether in class or otherwise) and there is some follow-up action the instructor has agreed to perform, you must email that instructor with a reminder. If you don’t send a follow-up email, whatever you talked about will be forgotten and not followed up on (regardless of what the instructor said at the time). Making follow-up emails a habit is excellent practice for the real-world of working with busy bosses, producers, executives, etc.

**Attendance**

Attendance at all classes is required, although if you email the instructor about any absences, they might be excused (especially if you send the email beforehand, but send one regardless). Poor attendance will result in a -2% penalty for each class missed. Note that absences are counted by the number of attendance sheets that you have not signed. Even if you have photographic proof that you were in class, it does not count if you do not sign the attendance sheet.

**Professionalism**

All students in this class are expected to behave in a professional manner in their interactions with all students, faculty, and staff. This includes personal conduct in class, verbal discussions, and emails. Rude or otherwise unprofessional conduct will result in a penalty of -5% to -10% on the student's final grade in the class, or more in extreme cases or in cases involving more than a single incident, at the sole discretion of the instructor. Exceptionally professional conduct, above and beyond what is normally expected, can result in up to a +5% bonus, also at the sole discretion of the instructor.

**Late Policy**

If an assignment is turned in late, its grade is halved, assuming it is turned in within a week of the due date. After one week, assignments can no longer be turned in. Missed quizzes can be made up within a week, but make-up quizzes are much, much harder.

**Last Day to Withdraw**

In order to withdraw from a course it is not sufficient simply to stop attending class or to inform the instructor. In accordance with the policy, contact your advisor or the registrar to begin the withdrawal process. The last day for withdrawal from this course is cited in the official catalog.

**Academic Integrity Policy**

Cheating, or academic dishonesty in any form, will not be tolerated in this course. Penalties for cheating may include receiving a zero on an assignment, or a failing grade in the course, or even expulsion from DigiPen. For further details, please consult the *DigiPen Academic Integrity Policy*.

**Disabled Student Services**

Students with physical, psychological or learning disabilities that affect their ability to perform major life activities associated with this class may be eligible for reasonable accommodations under the *Americans with Disabilities Act*. If you have a documented disability please contact the Disability Support Services office to arrange for accommodations.