ATENEO DE MANILA UNIVERSITY
Loyola Schools

**SYLLABUS FOR UNDERGRADUATE COURSES**
**MAJOR, CORE CURRICULUM and ELECTIVES**

## A. COURSE INFORMATION

| | | | | | |
|---|---|---|---|---|---|
| **COURSE NUMBER** | GDEV 41 / CS 179.14A | | | **NO. OF UNITS** | 3 |
| **COURSE TITLE** | PC AND CONSOLE GAME DEVELOPMENT 1 / SPECIAL TOPICS IN MULTIMEDIA: PC AND CONSOLE GAME DEVELOPMENT I | | | | |
| **PREREQUISITE/S** | | | | | |
| **DEPARTMENT/ PROGRAM** | DISCS | | | **SCHOOL** | SOSE |
| **SCHOOL YEAR** | SY 2020-2021 | | | **SEMESTER** | 1st |
| **INSTRUCTOR/S** | Ortega, Victor Antonio M. | | | | |
| **VENUE** | Online | **SECTION** | A-Q2 | **SCHEDULE** | T-TH 0930-1100 |

## B. COURSE DESCRIPTION

*The course focuses on the fundamentals of PC game programming to complement the skills learned mostly in GDEV 30: Computer Graphics Programming but also uses some concepts in CSCI 51 and CSCI 71. Students will learn how to build a game from scratch in order to gain a deep understanding of their architecture and components, as opposed to using a premade game-making software. The format of the lesson will be a mix of lectures followed-by hands-on implementation. By the end of the semester, the students should be able to produce a non-trivial game.*

| **WHERE IS THE COURSE SITUATED WITHIN THE FORMATION STAGES IN THE FRAMEWORK OF THE LOYOLA SCHOOLS CURRICULA** | |
|---|---|
| X | FOUNDATIONS: Exploring and Equipping the Self |
| X | ROOTEDNESS: Investigating and Knowing the World |
| | DEEPENING: Defining the Self in the World |
| | LEADERSHIP: Engaging and Transforming the World |

## C. COURSE LEARNING OUTCOMES

**Alignment of the Course to the Core Curriculum Learning Outcomes**

| The Ideal Ateneo Graduate: A Person of Conscience Competence Compassion Commitment | | | | | | | |
|---|---|---|---|---|---|---|---|
| CCLO 1 | CCLO 2 | CCLO 3 | CCLO 4 | CCLO 5 | CCLO 6 | CCLO 7 | CCLO 8 |
| X | X | X | | | | X | |

By the end of this course, students should be able to:

| COURSE LEARNING OUTCOMES |
|---|
| CLO1: Create, compile, and debug native applications on various platforms |
| CLO2: Prototype gameplay in a short amount of time |
| CLO3: Apply various architectures to make their game scale |
| CLO4: Apply mathematics to solve certain challenges in game programming |

## D. COURSE OUTLINE and LEARNING HOURS

| Course Outline | CLOs | Estimated Contact or Learning Hours |
|---|---|---|
| 1: Introduction and C/C++ Review | CLO 1, 2 | 8 |
| 2: Game Loop and Timing | CLO 1, 2, 3 | 5 |
| 3: Physics and Collision Detection | CLO 1, 2, 3 | 5 |
| 4: Data-Driven Design | CLO 3, 4 | 5 |
| 5: Polygons | CLO 1, 3, 4 | 5 |
| 6: Audio | CLO 1, 3 | 5 |
| 7: Entity Manager | CLO 3, 4 | 5 |
| 8: Finals Game Project | CLO 1, 2, 3, 4 | 8 |

## E. ASSESSMENTS AND RUBRICS

| Assessment Tasks | Assessment Weight | CLOs |
|---|---|---|
| Quizzes & Homework | 60% | CLO 1, 2, 3, 4 |
| Project Consultations | 5% | CLO 1, 2 |
| Project | 20% | CLO 1, 2, 3, 4 |
| Project Defense | 15% | CLO 1, 2, 3, 4 |

### RUBRICS

| Project | |
|---|---|
| Game Design | 35% |
| Game Mechanics | 35% |
| Programming (Bug-free) | 20% |
| Code & Documentation | 10% |

## F. TEACHING and LEARNING METHODS

| TEACHING & LEARNING METHODS and ACTIVITIES | CLOs |
|---|---|
| Downloadable Lecture Slides | CLO 1, 2, 3, 4 |
| Discussions & Debug Sessions | CLO 1, 2, 3, 4 |
| Individual Exercises | CLO 1, 2, 3, 4 |
| Group Homework | CLO 1, 2, 3, 4 |

## G. REQUIRED READINGS

All lecture slides and announcements can be found at the course web site on Moodle.

## H. SUGGESTED READINGS

Game Programming Patterns by Robert Nystrom (ISBN-13: 978-0990582908), 2014 (available online for free at `http://gameprogrammingpatterns.com`)

C++Now 2014 Presentations:
https://github.com/boostcon/cppnow_presentations_2014
Game Engine Architecture, by Jason Gregory, Jeff Lander and Matt Whiting, A K Peters (ISBN-13: 978-1568814131), 2009
Real-time Collision detection by David H. Eberly, Morgan Kaufmann (ISBN-13: 978-1558607323), 2005
Computer Graphics using OpenGL, 2nd Ed by F.S. Hill, Prentice Hall (ISBN: 0-02-354856-8), 2001
Ten C++11 Features Every C++ Developer Should Use:
http://www.codeproject.com/Articles/570638/Ten-Cplusplus-Features-Every-Cplusplus-Developer
Game Programming Gems series
Game Engine Gems series
Glenn Fiedler's Game Development Articles and Tutorials: http://gafferongames.com/
The Witness: http://the-witness.net/news/
Wolfire Games Blog: http://blog.wolfire.com/
Gamasutra: http://www.gamasutra.com/
Game Physics by David H. Eberly, Morgan Kaufmann
Thinking in C++ 2nd Ed. (Eckel, Bruce):
http://www.mindview.net/Books/TICPP/ThinkingInCPP2e.html
C++ FAQ lite: http://www.parashift.com/c++-faq-lite/
What Every Computer Scientist Should Know About Floating-Point Arithmetic
http://docs.oracle.com/cd/E19957-01/806-3568/ncg_goldberg.html
A Primer on Bézier Curves http://pomax.github.io/bezierinfo
Standard C++ https://isocpp.org/

## I. GRADING SYSTEM

The undergraduate grading system will be used.
In addition, numeric grades higher than 60 will be rounded up.

| | | |
|---|---|---|
| 93-100 | A | Excellent |
| 87-92 | B+ | Very Good |
| 81-86 | B | Good |
| 75-80 | C+ | Satisfactory |
| 69-74 | C | Sufficient |
| 60-68 | D | Passing |
| < 60 | F | Failure |

## J. CLASS POLICIES

1. Students should check the course website on Moodle for class updates.

2. If we are going to give something like a quiz or an assignment, there will always be a 2-3 day minimum allowance before the deadline.

3. No make-up exams or exercise/project deadline extension unless you were hospitalized or an immediate member of your family died (grandparents and legal guardians included) or there were circumstances that prevented you from coming to class. Adequate proof must be provided (e.g. medical certificate, news report) and the hospitalization/wake/disaster/aftermath period must cover the date of the exam or report deadline. All bonus point opportunities are removed for make-up tests.

4.Major deliverables must include a certificate of authorship, which can be found in http://www.ateneo.edu/ls/sose/iscs/downloads. It must state all resources and references that you used

except for lectures, slides, and syllabus-listed references. Submissions without a certificate will not be accepted and may incur a late penalty once a certificate has been included.

5. Late deliverables are subject to deductions (-10% of maximum score per day late, rounded up). This does not apply to quizzes (late submissions not accepted).

6. Because of the existence of bonus points, exceeding the maximum point total for certain requirements is possible. However, excess points will not allow you to exceed the maximum for the converted percentage grades listed in the Course Requirements section.

- Example#1: If you get 43/40 in all your tests, the grade does not get converted to 64.5% and is capped at 60%.

- Example#2: If you get 43, 41, and 36, you still get 60%.

7. Cumulative numeric grades below 60 are NOT rounded off, even if the grade is 59.9999~~~

8. No extra-credit work will be issued. Ever. Even if you ask nicely. I will ignore any requests for extra-credit work regardless of the circumstances that led to your making the request. This also applies to requests made by a third party on your behalf.

9. In case you need assistance regarding internet access, hardware, etc., you may access the following url: https://sites.google.com/ateneo.edu/ls-one

10. More policies may be added should the need to do so arise. However, these will require your consent if they are not issued by the department chair or another university authority.

## K. CONSULTATION HOURS

| NAME OF FACULTY | EMAIL | DAY/S | TIME |
|---|---|---|---|
| Victor Antonio M. Ortega | vortega@ateneo.edu | Weekdays | 0930-1100 |

## L. ADDITIONAL NOTES

If in any case you become unable to participate in the course activities (e.g. synchronous sessions, asynchronous activities) or comply with the requirements due to technical difficulties or other concerns, please let the instructor know so we can make necessary arrangements.

*v.1 05/2020*