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CS4483B/9541B - Game Design

The University of Western Ontario
London, Canada

Department of Computer Science

CS 4483B/9541B - Game Design

Course Outline - Winter 2022

Course Description

The video game industry is a very significant and important software industry, both for entertainment and serious applications. Building a high quality game is a surprisingly difficult and challenging process; exploitation of the latest technologies does not necessarily lead to success. In the end, much of a game's success (or failure) is dictated by its design. In other words, does the game offer engaging, immersive, and rewarding gameplay to the player, resulting in an overall satisfactory experience?

This course provides an in-depth examination of video game design and best practices to study the issues and challenges that arise when developing games for both entertainment and serious applications. Topics include: the history of video games; game development teams, processes, and management; principles of game design, game play, and balance; game genres and genre-specific design issues; plot, story, and level design; challenge design; ethical issues in video games and the gaming industry; and the future of gaming.

Lecture Hours: 1:30 - 3:30pm, Tuesdays, NCB-113
1:30 - 2:30pm, Thursdays, NCB-113

Prerequisites: Computer Science 3307A/B/Y or Software Engineering 3350A/B (for CS4483B) or enrolment in a graduate Computer Science program (for CS9541B).

Note: *Unless you have either the prerequisites for this course or written special permission from your Dean to enrol in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.*

Instructor Information

Instructor: Michael Katchabaw
Office: Consulting via [Zoom](#)
Office Hours: 12:30pm - 1:30pm, Tuesdays and Thursdays
E-Mail: katchab@csd.uwo.ca
Phone: Western extension 84059

About the Lectures

Please note that this class is being delivered in-person. In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

As an important note, Western continues to require medical-grade (ASTM level 3) masks indoors in instructional spaces for degree credit courses such as classrooms, labs and seminar rooms. Masks will remain available for pickup at Western [library locations](#) using your Western ONECard and will be available at some building entrances.

For up-to-date information on pandemic policies and procedures, please consult Western's [information page](#) accordingly.

Textbooks

Three books are recommended as references for this course, and may be available for purchase from the University Bookstore or other sources, such as the Used Book Store:

- R. Lemarchand, [*A Playful Production Process For Game Designers \(and Everyone\)*](#). MIT Press, 2021.
- J. Schell. [*The Art of Game Design*](#). Third Edition. CRC Press, 2019.
- E. Adams. [*Fundamentals of Game Design*](#). Third Edition. New Riders Press, 2013.

Each of these books are well written and serve as good references for the course. The Lemarchand book gives a good overview of game development processes, the Schell book is very interesting and insightful with respect to game design, and the Adams book is a classic in this area.

Course Topics

The course will address as many of the following topics as time will allow:

- **Games and gaming:** What are video games; the differences between entertainment and serious games; motivations for playing games; player modelling, types of game players, and demographics.
- **The history of video gaming:** Early mechanical and electronic gaming; the arcade environment; the advent of home gaming; highlights and key events.
- **The game development process:** Concept development; game proposals and pitches; preproduction; design techniques; production; development; content and asset management; team roles and composition; publishing models; promotion; business concepts; monetization; game analytics; the video game industry.
- **Principles of game design:** game theory; balance; interactivity; immersion; linearity versus nonlinearity; realism versus fun; genre-specific issues; plot and character development; narrative design and storytelling; level design; challenge, puzzle, and obstacle design; franchising and licensing.
- **Design implications from various underlying technologies:** Graphics technologies; artificial intelligence issues and approaches; networking issues; animation and motion capture; real-world physics in games; linguistic issues; sound and music.
- **Discussion issues:** Ethics in video games; inclusiveness and accessibility in games; copy protection; ownership rights and issues; emulation (hardware, server, and so on); the Entertainment Software Rating Board (ESRB); the future of gaming.

Lecture Notes

Course lecture notes will be made available in PowerPoint and PDF formats on the course website on a weekly basis, as they are developed. They are provided as a courtesy by the course instructor. Possessing (and even reading) these notes is not a suitable substitute for the lectures.

Course Website

The CS4483B website is accessible through OWL at <http://owl.uwo.ca>. Class and project information will be posted on this website on a fairly regular basis. You are responsible for reading this information frequently.

If students need assistance with the course OWL site, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

Computing Facilities

Each student will have access to computing facilities administered by the Department of Computer Science

and/or Western University. In accepting their accounts, students agree to abide by the Department's [Rules of Ethical Conduct](#). During this course, we may also make use of cloud infrastructure provided either by Western or by Amazon; details on this will be discussed in class. Computing facilities will be accessible online, remotely. Physical, in person access to labs and collaborative spaces will of course depend on the ever-changing COVID-19 situation on campus; please see the Department [home page](#) for more information and updates.

Note: *After-hours access to Computer Science lab rooms is by student card. If a student card is lost, you will need to visit the Student Services Building to obtain a replacement. As of 2023, the cost for a replacement card is \$32. More information is available at https://registrar.uwo.ca/services/western_onecard_and_photo_standards.html. Students enrolled in Computer Science courses will be granted access to the labs within 7 days of enrolment. If you do not have access to the labs after 7 days, please open a ticket with Science Technology Services at <https://helpdesk.sci.uwo.ca>.*

E-Mail Contact

We will occasionally need to send e-mail messages to the whole class, or to students individually. In accordance with policy (https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf), the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

Student Evaluation

Grades will be based on assignment/project work with 50% on individual project components and 50% on group project components. To be eligible to receive a passing grade in the course, your weighted average on the individual project components must be at least 40%. Otherwise, the maximum overall mark you can receive is 45%. To be eligible to receive a grade of C or higher, your weighted average on the individual project components must be at least 50%. Otherwise, the maximum overall mark you can receive is 58%.

Assignment and Project Feedback

Every effort will be made to have project components marked and handed back within 3 weeks of the handin date, preferably sooner. If we are unable to comply with our intended return dates, revised dates will be posted on the course website.

Assignments and Project Components

Due Dates (tentative)

Individual Pitch	15%	Assigned January 17, 2023	Due January 31, 2023
Individual Game Critique	15%	Assigned January 31, 2023	Due February 14, 2023
Individual Game Prototype	20%	Assigned January 31, 2023	Due March 7, 2023
Group Game Demo	40%	Assigned January 31, 2023	Due April 4, 2023
Group Game Postmortem	10%	Assigned January 31, 2023	Due April 10, 2023

If, for any reason, the schedule given above cannot be adhered to, the corresponding marks will be prorated accordingly.

About the Assignments and Projects

- Assignment and project descriptions will be posted on the course website by the dates listed above.
- Any changes, updates, and clarifications to these descriptions will also be posted on the website. It is your responsibility to monitor these pages closely.
- Project components will involve the conceptualization of a simple, innovative video game, the critique of other games, and the design and development of a game using a various tools, engine(s), and platforms.

Submission

- All assignment and project components must be type-written for legibility and to facilitate electronic submission.
- You are required to submit each assignment and project component electronically through OWL. (If final game submissions are too large for OWL submission, alternate arrangements will be made.) Details will be given in the descriptions. We reserve the right to use similarity detection software to detect possible plagiarism cases.
- Assignment and project components are expected to be individual efforts (where individual could also mean designated group in the case of a group project component). Any code or resources that are borrowed from an existing project, website, book, or other source must be clearly identified as such in the appropriate documentation; otherwise, this may constitute a plagiarism offence.

Late Policy

- Late assignment and project components will be accepted for up to two days after the due date, with weekends counting as a single day; the late penalty is 20% of the available marks per day, not the earned marks. Lateness is based on the time the assignment or project component is submitted.
- Extensions will be granted only by your course instructor. If you have serious medical or compassionate grounds for an extension, you **must** take supporting documentation to the Academic Counselling unit of your faculty, who will contact the instructor.

Marking

- Assignment and project components are marked by the instructor and/or a teaching assistant assigned to the course. We will attempt to include some information about the marking criteria in the appropriate descriptions.
- When marking has been completed, you will be informed via the course website and/or e-mail.
- A request for adjustment in a mark must be made within 2 weeks of the date on which it was first available. (Beyond that date, regrading will not be considered, regardless of whether you accessed your grade or not.) Such a request must be submitted in writing, and must include specific reasons why you believe you deserve more marks. The request must be accompanied by all materials that were originally handed in, as well as the original marker's grade summary sheet. Regrading requests will take a minimum of 24 to 48 hours to process; you will be informed when it is complete.
- Assignment and project component marks may be posted periodically throughout the term through OWL. It is your responsibility to check that your marks have been recorded correctly.

Backups

It is your responsibility to keep up-to-date backups of assignment and project files in case of system crashes or inadvertently erased files. Retain copies of all material handed in, as well as the actual graded version, to guard against the possibility of lost assignments/projects or errors in recording marks. It is not safe to discard these materials until you are satisfied that your final mark for the course has been computed properly.

Tutoring

The role of tutoring is to help students understand course material. Tutors should not write assignments or take-home tests for the students who hire them. Having employed the same tutor as another student is not a legitimate defense against an accusation of collusion, should two students hand in assignments judged similar beyond the possibility of coincidence.

Academic Consideration for Student Absence

If you are unable to meet a course requirement due to illness or other serious circumstances, academic consideration may be granted. In all such circumstances, you must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible. For further information, please consult the University's policy on academic consideration for medical illness at: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration.pdf. The Student Medical Certificate is available at: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

For individual assessments, student absences will generally be handled through an extension, as there is no final exam in the course. Student absences impacting group project assessments will be handled on a case-by-case basis to accommodate the student as best as possible while minimizing the impact on the rest of the group.

Accommodation Policy

Students with disabilities work with Accessible Education which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The Academic Accommodation for Students with Disabilities policy can be found at:

[https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic Accommodation_disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf).

Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at: <https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>.

Ethical Conduct

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Plagiarism: Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence. Please note, however, that students are not allowed to make use of the work of others unless explicitly instructed to do so in the description of an assignment.

All projects are to be exclusively your own work. While project work requires you to work in teams, each team is expected to act individually. You may discuss approaches to problems among yourselves; however, the actual details of the work (coding, documentation, etc.) must be an individual effort. Incidents that are judged to be the result of academic dishonesty will be reported to either the [Undergraduate or Graduate Chair](#) depending on your enrolment. The selection of penalty to be applied is up to the appropriate Chair, with consultation of the instructor.

The standard departmental penalty for assignments that are judged to be the result of academic dishonesty is, for the student's first offence, a mark of zero for the assignment, with the offence reported

to the Dean of your home faculty. You are responsible for reading and respecting the Department of Computer Science's policy on [Scholastic Offenses](#), and [Rules of Ethical Conduct](#).

While the group project is expected to be a team effort, you must still follow these rules and avoid plagiarism when it comes to using other people's code and so on in the project. While the use of other code and resources in your project is encouraged, you must clearly identify all such code in your project documentation. Failure to do so will be considered a scholastic offence.

The University of Western Ontario uses software for plagiarism checking. Students may be required to submit their written work and programs in electronic form for plagiarism checking.

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com/>).

Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>.

Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at: https://www.uwo.ca/health/student_support/survivor_support/get-help.html. To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at: http://academicsupport.uwo.ca/accessible_education/index.html if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (<https://learning.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Additional student-run support services are offered by the USC, <https://westernusc.ca/services/>.

The website for Registrarial Services is <http://www.registrar.uwo.ca>.