



CPSC 601.11 - Special Topics in Computer Science - Winter 2025, Topic: Applied AI in Games

COURSE OUTLINE

The University of Calgary, located in the heart of Southern Alberta, both acknowledges and pays tribute to the traditional territories of the peoples of Treaty 7, which include the Blackfoot Confederacy (comprised of the Siksika, the Piikani, and the Kainai First Nations), the Tsuut'ina First Nation, and the Stoney Nakoda (including Chiniki, Bearspaw, and Goodstoney First Nations). The City of Calgary is also home to the Métis Nation of Alberta (Districts 5 and 6).

A. Course Information

1. Course Coordinator(s)

Not Applicable

2. Lecture Section(s)

Lecture 01 : TR 12:30 - 13:45 in MS 156

Instructor	Email	Phone	Office	Student/Office Hours
Dr. Richard Zhao	richard.zhao1@ucalgary.ca	Zoom or Discord	ICT 748	Thursdays 2-3pm and by appointment

3. Lab and Tutorial Sections

There are no lab or tutorial sections scheduled for this course.

4. Scheduled Out-Of-Class Activities

There are no scheduled out of class activities for this course.

5. Additional Course Delivery Details

AI techniques commonly used in video games, such as behaviour trees, search-based methods, and machine learning. Implementation of AI techniques in a commercial game engine and detailed exploration of research methods in these techniques.

Prerequisite: An equivalent course to Design and Analysis of Algorithms

There is a TA help session on Tuesdays 2-3:50pm in MS 119

6. Course Site & Materials

D2L: CPSC 601.11/CPSC 599.11 - (Winter 2025) - Applied AI in Games

Supplementary website: <https://cspages.ucalgary.ca/~richard.zhao1/gameai.html>

Recommended Textbook(s):

Georgios N. Yannakakis and Julian Togelius, *Artificial Intelligence and Games*: Springer.

Technology:

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security, and malware updates;
- A current and updated web browser;
- Webcam/Camera (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Stable internet connection.

For more information please refer to the UofC [ELearning](#) online website.

Relevant reading material and videos will be posted to D2L.

For assignments, Unreal Engine 4 is required. Please use version 4.27.2 as your work will be graded in this version.

<https://www.unrealengine.com/>

For the research project, there are no restrictions on tools.

7. Approved Mandatory & Optional Course Supplemental Fees

There are no mandatory or optional course supplemental fees for this course.

8. Requisites

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

9. Course Learning Outcomes

B. Assessment and Evaluation Information

1. Assessment Components

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar.

In determining the overall grade in the course the following weights will be used:

Course Component	Weight	Due Date (duration for exams)	Modality for exams	Location for exams
Assignment 1	4%	Jan 24 2025		
Assignment 2	4%	Jan 31 2025		
Assignment 3	4%	Feb 07 2025		
Assignment 4	4%	Feb 14 2025		
Assignment 5	4%	Feb 28 2025		
Midterm Exam ¹	20%	Mar 07 2025 at 10:00 am (1 Days)	online	Home
Research Project Presentation 1 ²	5%	Mar 11 2025		
Research Project Proposal	10%	Mar 14 2025		
Research Project Discussions ³	5%	Apr 01 2025		
Research Project Presentation 2 ⁴	10%	Apr 10 2025		
Research Paper	30%	Apr 25 2025		

¹ Take-home midterm exam where each student has 24 hours to complete starting 10am. Open book but must be completed individually without collaboration.

² In class

³ Each student group needs to sign up for a time.

⁴ In class

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

2. Assessment & Grading

While the project is team work, grades will be assigned individually based on each individual's performance.

Reappraisal of Graded Term Work and Final Grades:

See [Section I](#) of the University Calendar and <https://science.ucalgary.ca/current-students/undergraduate/program-advising/grade-reappraisals-and-appeals>.

3. Examination Policy

The midterm exam must be completed individually, following regulations on academic integrity.

See also [Section G](#) of the Calendar, on Academic Assessments and Examinations.

4. Missed Components of Term Work

For any missed assignment due to an excused absence, the percentage weight of the assignment will be pro-rated among the other assignments of the course.

Five "personal days" will be provided to all students. Use these days at your own discretion and without explanation during the course for assignment extensions. For example, you could submit your second assignment 3 days late and your third assignment 2 days late, or just your fifth assignment 5 days late. Personal day usages are automatically calculated when you submit an assignment late. Assignments will not be accepted if they are not submitted on time and all personal days have

been used.

For a missed midterm exam due to an excused absence, a makeup midterm will be scheduled with the student.

See also Sections [G2.3](#) and [M.1.1](#) of the Calendar, on Absence from In Course Assessments and Supporting Documentation for Absences.

5. Letter Grade Conversion

The conversion between a percentage grade and letter grade is as follows.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Minimum % Required	95 %	90 %	85 %	80%	75%	70 %	65 %	60%	55%	50 %	45 %

All assignments and the midterm exam must be completed individually, following regulations on academic integrity.

Group members will be individually graded based on their own contributions to the project.

The University of Calgary offers a [flexible grade option](#), Credit Granted (CG) to support student's breadth of learning and student wellness. Faculty units may have additional requirements or restrictions for the use of the CG grade at the faculty, degree or program level. To see the full list of Faculty of Science courses where CG is not eligible, please visit the following website: <https://science.ucalgary.ca/current-students/undergraduate/program-advising/undergraduate-processes>

C. Course Policies & Procedures

1. Equity Diversity & Inclusion

The University of Calgary is committed to creating an equitable, diverse and inclusive campus, and condemns harm and discrimination of any form. We value all persons regardless of their race, gender, ethnicity, age, LGBTQIA2S+ identity and expression, disability, religion, spirituality, and socioeconomic status. The Faculty of Science strives to extend these values in every aspect of our courses, research, and teachings to better promote academic excellence and foster belonging for all.

2. Course Communication

Students must use their U of C account for all course correspondence.

3. Academic Integrity and Misconduct

Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity. Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional [Code of Conduct](#) and promote academic integrity in upholding the University of Calgary's reputation of excellence. Some examples of academic misconduct include but are not limited to: posting course material to online platforms or file sharing without the course instructor's consent; submitting or presenting work as if it were the student's own work; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. Please read the following to inform yourself more on academic integrity:

[Student Handbook on Academic Integrity](#)
[Student Academic Misconduct Policy and Procedure](#)
[Faculty of Science Academic Misconduct Process](#)
[Research Integrity Policy](#)

Additional information is available on the [Student Success Centre Academic Integrity page](#)

4. Acceptable & Prohibited Tools and Resources

Artificial Intelligence (AI) Usage Policy:

Students may use AI tools in this course as learning aids or to help with solving specific errors encountered during assignments, but not for generating blocks of code for their submitted work.

Students are ultimately accountable for the work they submit. Use of AI tools must be documented with each submission. The documentation should include what tool(s) were used, how they were used, and how the results from the AI were incorporated into the submitted work. Failure to cite the use of AI generated content will be considered a breach of academic integrity and subject to Academic Misconduct procedures.

5. Writing Across the Curriculum

Writing skills are not exclusive to English courses and, in fact, should cross all disciplines. The University supports the belief that throughout their University careers, students should be taught how to write well so that when they graduate their writing abilities will be far above the minimal standards required at entrance. Consistent with this belief, students are expected to do a substantial amount of writing in their University courses and, where appropriate, members of faculty can and should use writing and the grading thereof as a factor in the evaluation of student work. The services provided by the [Writing Support](#), part of the [Student Success Centre](#), can be utilized by all undergraduate and graduate students who feel they require further assistance. See also [Section E.2](#) of the University Calendar.

6. Academic Accommodations

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The student accommodation policy can be found at: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Accommodation-Policy.pdf>

Students needing an accommodation because of a disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf>.

Students needing an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, by filling out the [Request for Accommodation in Academic Courses Form](#) and sending by email to science@ucalgary.ca preferably 10 business days before the due date of an assessment or scheduled absence.

7. Instructor Intellectual Property.

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright ([ucalgary.ca/legal-services/university-policies-procedures/acceptable-use-material-protected-copyright-policy](https://www.ucalgary.ca/legal-services/university-policies-procedures/acceptable-use-material-protected-copyright-policy)) and requirements of the copyright act (laws-lois.justice.gc.ca/eng/acts/C-42/index.html) to ensure they are aware of the consequences of unauthorized sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy.

8. Recording of Lecture

Audio recording of lectures, other than where an audio recording is an accommodation, shall be permitted for individual private study only at the discretion of the instructor. For any other use, whether by duplication, transcription, publication, sale or transfer of recordings, written approval must be obtained from the instructor for the specific use proposed. Any use other than that described above constitutes academic misconduct and may result in suspension or expulsion. For more information, see [Section E.6](#) Recording of Lectures of the University Calendar.

9. Freedom of Information & Privacy

This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPPA). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see [Legal Services](#) website.

10. Human & Living Organism Studies Statements

Students will not participate as subjects or researchers in human studies.

See also [Section E.5](#) of the University Calendar.

D. Copyright Legislation

All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or [non-academic misconduct](#), in addition to any other remedies available at law.

E. Support & Resources

Student well-being and safety resources that are not course-specific can be found on the Office of the Registrar's website: <https://www.ucalgary.ca/registrar/registration/course-outlines>

Approvals Pending