

Course Outline – Artificial Intelligence

General Information

Course #	COMP 424
Term / Year	Winter 2021
Prerequisites	COMP 206 or ECSE 321 MATH 323 or equivalent COMP 251
Course schedule	Lectures released Tuesdays and Thursdays (by the end of the day)
Number of credits	3

Instructor Information

Name and title	Jackie Chi Kit Cheung, Prof.
E-mail	jcheung@cs.mcgill.ca
Virtual office hours	Tuesdays, 2:30pm – 4:30pm Thursdays, 9:00am – 11:00am

TA Information

List is tentative	
Names and e-mails	Manoosh Samiei manoosh.samiei@mail.mcgill.ca Zhuoran Xiong zhuoran.xiong@mail.mcgill.ca David Venuto david.venuto@mail.mcgill.ca Mingde Zhao mingde.zhao@mail.mcgill.ca Erfan Seyedsalehi erfan.seyedsalehi@mail.mcgill.ca Arna Ghosh arna.ghosh@mail.mcgill.ca Arushi Jain arushi.jain@mail.mcgill.ca Samin Yeasar Arnob samin.arnob@mail.mcgill.ca Aishik Chakraborty aishik.chakraborty@mail.mcgill.ca Arnab Kumar Mondal arnab.mondal@mail.mcgill.ca Shuyuan Zhang shuyuan.zhang@mail.mcgill.ca Bingchan Ma bingchan.ma@mail.mcgill.ca Wael Al Enezi wael.alenezi@mail.mcgill.ca

Course Overview

Introduction to search methods. Knowledge representation using logic and probability. Planning and decision making under uncertainty. Introduction to machine learning.

Message Regarding Remote Delivery

Lectures will be pre-recorded and posted on myCourses. This term will be unusual, and may present extra challenges for many students. We will do our best to provide a supportive learning environment, and to actively engage you in this course through contact hours with the teaching staff, and discussion opportunities with other students.

Learning Outcomes

By the end of the course, students should have a broad understanding of the major areas in artificial intelligence, and some of the most important ideas and concepts in the field. They should be able to implement algorithms to AI problems and identify which kinds of techniques fit with which kinds of problems. Finally, they should be aware of the major trends and historical evolution of AI, as well as the strengths and limitations of current approaches.

Course Materials

Artificial Intelligence: A Modern Approach. Russell and Norvig. 3rd edition.

You may purchase a copy of this textbook from the McGill bookstore or through an online retailer.

Course Content

This list is tentative and subject to modifications.

- Search
- Game playing
- Logical reasoning
- Classical planning
- Probabilistic reasoning
- Learning probabilistic models
- Causal probabilistic models
- Utility theory
- Decision theory
- Sequential reasoning
- Applications

Evaluation

Assignments	20%
Study groups	5%
Online quizzes	10%
Midterm examination	15%
Final examination	25%
Project	25%

Students who receive unsatisfactory final grades will not have the option to submit additional work in order to improve their grades.

Assignments (20%)

Assignments will be worth 20% in total. They may involve programming, solving problem sets, and reading academic papers. To receive full grades, assignments must represent your own personal efforts, unless otherwise explicitly stated in the assignment handout.

Late policy. Only assignments submitted by the indicated deadline are guaranteed to be accepted. We will accept late assignments at our discretion and convenience, or in case of a valid extenuating circumstance.

Assignment submission will take place on myCourses. Every student is responsible for verifying that their submissions are successful. If you believe the content of your myCourses submission box is different from what you have submitted, you must e-mail me immediately to provide evidence of your correct submission.

The instructor reserves the right to modify the lateness policy for a particular assignment; any such modifications will be clearly indicated at the beginning of the relevant assignment specifications.

Study Groups (5%)

You will be expected to participate in online group discussions with other students, and then to write up a short summary of your discussions to be submitted on myCourses. We will make efforts to accommodate any issues with technology, time zone differences, or other personal circumstances. We will release more details and guidelines for these discussions.

Online Quizzes (10%)

Short online quizzes will be posted on myCourses. The purpose of these quizzes is to ensure that you follow along with the lectures, and that you can check if you have understood the content. You will be allowed multiple trials to correct any mistakes. These quizzes must be completed individually.

Midterm and Final Examinations (15% + 25%)

There will be two examinations, to be conducted online. The first will be held during the semester, and the second will be held during the final exam period. Each will be designed to take 80 minutes to complete, but you will be given extra time according to McGill's Guidelines for the Remote Teaching Context (W2021).

Project (25%)

The course project involves implementing an AI agent to play a game, which will be pitted against other students' agents and several baselines in a tournament. You will also be required to write a report to explain how you designed and implemented your agent. Your grade for the project will depend on both its performance in the tournament and on the written report.

Plagiarism Policy

You must include your name and McGill ID number at the top of each program or module that you implement and submit. By doing so, you are certifying that the program or module is entirely your own, and represents only the result of your own efforts.

Work submitted for this course must represent your own efforts. Assignments must be done individually; you must not work in groups unless otherwise stated. You must not copy any other person's work in any manner (electronically or otherwise), even if this work is in the public domain or you have permission from its author to use it and/or modify it in your own work. The only exceptions are for source code supplied by the instructor explicitly for an assignment, and for the project, where usual research citation practices apply. Furthermore, you must not give a copy of your work to any other person.

The plagiarism policy is not meant to discourage interaction or discussion among students. You are encouraged to discuss assignment questions with the instructor, TA, and your fellow students. However, there is a difference between discussing ideas and working in groups or copying someone else's solution. A good rule of thumb is that when you discuss assignments with your fellow students, you should not leave the discussion with written notes. Also, when you write your solution to an assignment, you should do it on your own.

Students who require assistance with their assignments should see the TA or instructor during their office hours. If you have only partially finished an assignment, document the parts that do not work, and submit what you managed to complete for partial credit.

We may use automated software similarity detection tools to compare your assignment submissions to that of all other students registered in the course, and these tools are very effective at what they have been designed for. However, note that the main use of these tools is to determine which submissions should be manually checked for similarity by an instructor or TA; we will not accuse anyone of copying or working in groups based solely on the output of these tools.

You may also be asked to present and explain your assignment submissions to an instructor at any time.

Students who put their name on programs or modules that are not entirely their own work will be referred to the appropriate university official who will assess the need for disciplinary action.

Language of Submission

“In accord with McGill University’s Charter of Students’ Rights, students in this course have the right to submit in English or in French any written work that is to be graded. This does not apply to courses in which acquiring proficiency in a language is one of the objectives.”

« Conformément à la Charte des droits de l’étudiant de l’Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté (sauf dans le cas des cours dont l’un des objets est la maîtrise d’une langue). »

Academic Integrity

“McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism, and other academic offenses under the Code of Student Conduct and Disciplinary Procedures (see McGill’s guide to academic honesty (<https://www.mcgill.ca/students/srr/honest>) for more information).”