

# COMP-424: Artificial Intelligence

McGill University, Winter 2020

## Course Details

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Lecture room:	McIntyre 522
Class times:	TR 8:35–9:55
Teaching Assistants:	(subject to change)
Nishant Mishra	
Devandra Sachan	
Pierre Orhan	
Mohammad Shalaby	
Patrick Nadeem Ward	
Gandharv Patil	
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Maxime Wabartha	
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## Important Links

- myCourses : <http://www.mcgill.ca/lms/>

## Course Description

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

This course presents an introduction to the field of artificial intelligence. We will discuss how we can define intelligence in automatic systems, then discuss how to design and implement systems that exhibit intelligent behaviour. The first part of the course covers fundamental techniques in the field, including search algorithms and constraint satisfaction problems. The second part of the course concerns itself with knowledge representation and planning involving logical representations. Then, we will examine how we can develop agents that perform complex reasoning under uncertainty using probabilistic representations and utility theory. Finally, we will conclude the course with current and potential future applications of AI.

## Course Prerequisites and Textbooks

Prerequisites:

- COMP 206 or ECSE 321
- MATH 323 or equivalent
- COMP 251

Textbook (required):

- *Artificial Intelligence: A Modern Approach*, 3rd ed. Russell and Norvig.

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

## Topics

This list is tentative and subject to modifications.

- Search
- Game playing
- Logical reasoning
- Classical planning
- Probabilistic reasoning
- Learning probabilistic models
- Causal probabilistic models
- Reasoning with utilities
- Sequential reasoning and decision-making
- Learning complex sequential decisions
- Applications

## Grading Scheme and Deadline Policy

Your final grade in the course is calculated as follows:

- **Assignments:** 20%
- **Midterm examination:** 20%
- **Project:** 20%
- **Final examination:** 40%

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

**Official language policy for graded work:** 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.

In the event of extraordinary circumstances beyond the university's control, the evaluation scheme in a course is subject to change, provided that there be timely communications to the students regarding the change.

## Assignments

Assignments will be worth 20% in total. They may involve programming, solving problem sets, and reading academic papers. To receive full grades, assignments (as well as all other course work) **MUST** represent your own personal efforts (see the section on Plagiarism Policy and Assignments below).

**Late Policy:** Only assignments submitted by the indicated deadline are guaranteed to be accepted. We will accept late assignments at our discretion and convenience.

Assignment submission will take place on myCourses, as described in the assignment handout. 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 instructors reserve 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. **Plan appropriately and do not submit to myCourses only minutes before the assignment deadline.**

## Midterm Examination

The midterm examination is scheduled to be held in the evening of February 19, 2020. More details will follow.

The location will be confirmed closer to the midterm date. If you will miss the midterm due to extenuating circumstances, please e-mail me immediately.

## Project

There will be a project for the course, which will involve 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 implemented your agent. Your grade for the project will depend on both its performance in the tournament and on the written report.

## Plagiarism Policy

**Official policy:** 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 [www.mcgill.ca/integrity/](http://www.mcgill.ca/integrity/) for more information).

## Plagiarism Policy and Assignments

**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** unless otherwise specified; you **must not** work in groups unless the assignment specifies otherwise. 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 (obviously, this prohibition does not apply to source code supplied by the instructor explicitly for this purpose). 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, TAs, 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 be using 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.