University of Waterloo

Term and Year of Offering: Spring 2022

Course Number and Title: CS486, Introduction to Artificial Intelligence

Section	Lecture Time	Room	Instructor
LEC 001	2:30-400 TTh	RCH302	Jesse Hoey
LEC 002	1-230 TTh	RCH302	Jesse Hoey

Instructor's Name	Office Location	Contact	Office Hours
Jesse Hoey	DC3613	jhoey@uwaterloo.ca	Fridays 2pm-330pm

TA's Name	Office Location	Contact	Office Hours
Kelechi Ogueji		kjogueji@uwaterloo.ca	
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Course Description:

This course introduces students to the fundamental problems of artificial intelligence and the basic models and algorithms used to tackle these problems. Students examine frontier areas of computer science and gain knowledge that will allow them to further their studies in artificial intelligence.

Course Objectives:

At the end of the course, students should be able to

- Describe some of the fundamental problems of artificial intelligence.
- Identify basic models and algorithms used in artificial intelligence.
- Demonstrate understanding of how and when to apply artificial intelligence models and algorithms.
- Describe current research trends in artificial intelligence.

Course Overview:

What is AI?

Agents and Abstraction
States and Searching
Features and Constraints
Propositions and Inference
Reasoning under uncertainty
Supervised Learning
Planning under certainty
Planning under uncertainty
Machine Learning
Neural Networks
Deep Learning
Other topics

Required text:

David Poole and Alan Mackworth "Artificial Intelligence: foundations of computational agents". Cambridge University Press, 2010. Available online at artint.info

Evaluation:

CS486:

- Assignments (4): 40% (10% each) Dates TBA
- Midterm Exam: 15% June 8th, 2022, 7pm in M3-1006
- Final Exam: 45% (must pass to pass the course)
- Optional project: 5% bonus (hand in at final exam)

CS686 (graduate students only):

- Assignments (4): 25% (6.25% each) Dates TBA
- Midterm Exam: 10% Jun 8, 2022, 7pm in M3-1006
- Final Exam: 35%
- Project: 30% (hand in at final exam)

Late and Missed Assignments Policy:

No late assignments

Rules for Group Work:

No group work is allowed for any assignment. Small groups (at most 3 people) can work on the project together (CS486 only). CS686 projects are individual only.

Assignment Submission and Pickup:

Assignments are to be submitted and marked via Learn.

Mental Health Resources

Mental Health: If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support.

On-campus Resources

- Campus Wellness https://uwaterloo.ca/campus-wellness/
- Counselling Services: counselling.services@uwaterloo.ca / 519-888-4567 ext 32655 / Needles Hall North 2nd floor, (NH 2401)
- MATES: one-to-one peer support program offered by Federation of Students (FEDS) and Counselling Services: mates@uwaterloo.ca
- Health Services service: located across the creek from Student Life Centre, 519-888-4096.

Off-campus Resources

- Good2Talk (24/7): Free confidential help line for post-secondary students. Phone: 1-866-925-5454
- Here 24/7: Mental Health and Crisis Service Team. Phone: 1-844-437-3247
- OK2BME: set of support services for lesbian, gay, bisexual, transgender or questioning teens in Waterloo. Phone: 519-884-0000 extension 213

Diversity: It is our intent that students from all diverse backgrounds and perspectives be well served by this course, and that students' learning needs be addressed both in and out of class. We recognize the immense value of the diversity in identities, perspectives, and contributions that students bring, and the benefit it has on our educational environment. Your suggestions are encouraged and appreciated. Please let us know ways to improve the effectiveness of the course for you personally or for other students or student groups. In particular:

- We will gladly honour your request to address you by an alternate/preferred name or gender pronoun. Please advise us of this preference early in the semester so we may make appropriate changes to our records.
- We will honour your religious holidays and celebrations. Please inform of us these at the start of the course.
- We will follow AccessAbility Services guidelines and protocols on how to best support students with different learning needs.

Academic Integrity

Academic Integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check https://uwaterloo.ca/academic-integrity/ for more information.]

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4. When in doubt please be certain to contact the department's administrative assistant

who will provide further assistance.

Discipline: A student is expected to know what constitutes academic integrity [check https://uwaterloo.ca/academic-integrity/] to avoid committing an academic offence, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about 'rules' for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate Associate Dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline. For typical penalties check Guidelines for the Assessment of Penalties.

Appeals: A decision made or penalty imposed under Policy 70 (Student Petitions and Grievances) (other than a petition) or Policy 71 (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72, Student Appeals.

MOSS (Measure of Software Similarities) is used in this course as a means of comparing students' assignments to ensure academic integrity. We will report suspicious activity, and penalties for plagiarism/cheating are severe. Please read the available information about academic integrity very carefully.

Discipline cases involving any automated marking system such as Marmoset or MarkUs include, but are not limited to, printing or returning values in order to match expected test results rather than making an actual reasonable attempt to solve the problem as required in the assignment question specification.

Note for Students with Disabilities: AccessAbility Services, located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

Intellectual Property: Students should be aware that this course contains the intellectual property of their instructor, TA, and/or the University of Waterloo. Intellectual property includes items such as:

- Lecture content, spoken and written (and any audio/video recording thereof);
- Lecture handouts, presentations, and other materials prepared for the course (e.g., PowerPoint slides);
- Questions or solution sets from various types of assessments (e.g., assignments, quizzes, tests, final exams); and
- Work protected by copyright (e.g., any work authored by the instructor or TA or used by the instructor or TA with permission of the copyright owner).

Course materials and the intellectual property contained therein, are used to enhance a student's educational experience. However, sharing this intellectual property without the intellectual property owner's permission is a violation of intellectual property rights. For this reason, it is necessary to ask the instructor, TA and/or the University of Waterloo for permission before uploading and sharing the intellectual property of others online (e.g., to an online repository).

Permission from an instructor, TA or the University is also necessary before sharing the intellectual property of others from completed courses with students taking the same/similar courses in subsequent terms/years. In many cases, instructors might be happy to allow distribution of certain materials. However, doing so without expressed permission is considered a violation of intellectual property rights.

Please alert the instructor if you become aware of intellectual property belonging to others (past or present) circulating, either through the student body or online. The intellectual property rights owner deserves to know

(and may have already given their consent).