COMP 3106A – Fall 2022
Introduction to Artificial Intelligence

Course Information
Class times: Mondays & Wednesdays, 8:30am – 10:00am
Classroom: In-person (consult public class schedule)
Course Website: https://brightspace.carleton.ca/d2l/home/143804

Instructor
Matthew Holden
Contact: matthew.holden@carleton.ca
Office Hours Time: Mondays 10:00am – 11:00am, Wednesdays 11:30am – 12:30pm (or by appt)
Office Hours Location: Herzberg Laboratories 5435

Teaching Assistants
Daniil Kulik
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Office Hours Time: Tuesdays 12:00noon – 2:00pm
Office Hours Location: TBD

Jersey Aubin-Dery
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Office Hours Time: Fridays 9:00am – 11:00am
Office Hours Location: TBD

Course Calendar Description
Principles and tools used in Artificial Intelligence. Fundamentals of Knowledge Representation and Reinforcement Learning and Nature-Based computing. Methods for non-adversarial problem solving including non-exhaustive and heuristic-based strategies for searching the state space. Methods for adversarial problem solving, modeled as two-person and multi-person games.

Topics Covered
- Agents and agent-based systems
- Heuristic search
- Principles of machine learning
- Bayes theorem and Bayesian inference
- Rule-based systems
- Reinforcement learning
- Artificial Life
- Natural language processing

- Artificial neural networks

Prerequisites
Prerequisite(s): (COMP 2402 or SYSC 2100) and (COMP 2404 or SYSC 3010 or SYSC 3110) and COMP 2804.

Course Format
This course will be in-person. During class, we will have interactive activities such as: discussions, tutorials, demonstrations, examples, exercises, etc. In-person class attendance is very important as students will be responsible for all items discussed in class.

Communication
All announcements for the course will be made through Brightspace. You are responsible for regularly monitoring these announcements. In-person classes may also be used to elaborate on announcements.

Students are requested to ask questions or have discussions about the course or course material during the in-person classes, during instructor or TA office hours, or on Brightspace. This way, other students may benefit from the discussion. You may not, however, post solutions to the assessments during the live classes or Brightspace. Questions or discussion about your individual situation may be asked by email.

Textbook(s) and Other Resources
Recommended textbook:
Stuart Russell & Peter Norvig. Artificial Intelligence: A Modern Approach, 4th Edition. Pearson (2020). ISBN-13: 9780134610993.

The course may also use supplementary online resources available publicly or through the Carleton Library. Information on accessing these resources will be provided in class or posted on Brightspace.

This course will use Poll Everywhere, Carleton University's tool for in-class polling. See here for details: https://carleton.ca/edc/pollev/.

Assessment Scheme
Students will be evaluated in this course according to the following scheme. Details, dates, and submission procedures for each component will be posted on Brightspace.

Component	Weight
Assignments (3) & Quizzes (3)	60%
Participation	5%
Project	35%

Assignments & Quizzes

There will be three assignments. Each assignment will contain an implementation and an associated technical document. Implementations must be written in Python 3. Assignments may be completed individually or in small groups of up to three students.

There will be three quizzes. Each quiz will be 80 minutes in length and take place in-person during regularly scheduled class time. Quizzes are open-book, and you may consult your notes and the textbook during quizzes. You may not use electronic devices (except non-programmable scientific calculators) during quizzes; you may not consult other people during quizzes. Quizzes must be completed individually.

Each assignment and each quiz will be worth 12% of the total grade. The lowest assignment grade or the lowest quiz grade (not both) will be excluded from the total grade. That is, the best five out of six assignments and quizzes will count toward your total grade.

Participation

Students may participate in the activities listed below. The best five activities will count towards your participation grade. Additional activities for participation may be added throughout the term.
- Syllabus mini quiz
- Discussion prompts (minimum four will be provided)
- Midterm survey

Project

Students will complete a project that solves a problem using techniques from artificial intelligence. The project will comprise: (1) a project proposal outlining the problem, (2) a project report detailing the work completed, and (3) a live demonstration of the work. Projects may be completed individually or in small groups of up to three students.

Important Considerations

If you are unsure of the expectations regarding academic integrity (e.g. how to use and cite references, how much collaboration with classmates is appropriate), ask your instructor beforehand. Sharing assignment or quiz specifications or posting them online (to sites like Chegg, CourseHero, OneClass, etc.) is considered academic misconduct. You are never permitted to post, share, or upload course materials without explicit permission from your instructor. Academic integrity offences are reported to the office of the Dean of Science. Penalties for such offences can be found on the ODS webpage: https://science.carleton.ca/academic-integrity/.

For each assignment, the project proposal, and the project report, you will be given a 48-hour grace period. Submissions within this 48-hour grace period will be accepted without penalty. Late submissions beyond the grace period will not be accepted. This will be strictly enforced. "Last-minute" requests for extensions or exceptions to these rules will not be granted (except for accommodations provided by university policy). Technical problems do not exempt you from this

requirement. Consequently, you are advised to: (1) periodically upload your progress (e.g. upload your progress at least daily) and (2) attempt to submit your final submission well in advance of the due date and time.

For each assignment, you will be submitting one or more files that contain source code. These files must be written in Python 3, be given the correct filename, and be provided in the specified format. Assignments that are incorrectly named or in the incorrect format will be penalized and may receive a mark of zero. If any of the source code files you submit does not run, it may receive a mark of zero. Furthermore, you are expected to demonstrate good programming practices, and your code may be penalized if it is poorly written. You are also expected to do the necessary preparatory work (i.e. devising an algorithm) before you start coding. You may be asked to present either pseudocode or a flowchart before you will receive any assistance from the instructor or a teaching assistant.

Undergraduate Academic Advisor

The Undergraduate Advisor for the School of Computer Science is available in Room 5302C HP; by telephone at 520-2600, ext. 4364; or by email at undergraduate_advisor@scs.carleton.ca. The undergraduate advisor can assist with information about prerequisites and preclusions, course substitutions/equivalencies, understanding your academic audit and the remaining requirements for graduation. The undergraduate advisor will also refer students to appropriate resources such as the Science Student Success Centre, Learning Support Services and Writing Tutorial Services.

SCS Computer Laboratory

SCS students can access one of the designated labs for your course. The lab schedule can be found at: https://carleton.ca/scs/tech-support/computer-laboratories/. All SCS computer lab and technical support information can be found at: https://carleton.ca/scs/technical-support/. Technical support is available in room HP5161 Monday to Friday from 9:00 until 17:00 or by emailing support@scs.carleton.ca.

University Policies

For information about Carleton's academic year, including registration and withdrawal dates, see Carleton's Academic Calendar.

Pregnancy Obligation. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit Equity Services.

Religious Obligation. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit Equity Services.

Academic Accommodations for Students with Disabilities If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. For more details, visit the Paul Menton Centre website.

Survivors of Sexual Violence. As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: carleton.ca/sexual-violence-support**.**

Accommodation for Student Activities. Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, see the policy.

Student Academic Integrity Policy. Every student should be familiar with the Carleton University student academic integrity policy. A student found in violation of academic integrity standards may be awarded penalties which range from a reprimand to receiving a grade of *F* in the course or even being expelled from the program or University. Examples of punishable offences include: plagiarism and unauthorized co-operation or collaboration. Information on this policy may be found here.

Plagiarism. As defined by Senate, "plagiarism is presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own". Such reported offences will be reviewed by the office of the Dean of Science.

Unauthorized Co-operation or Collaboration. Senate policy states that "to ensure fairness and equity in assessment of term work, students shall not co-operate or collaborate in the completion of an academic assignment, in whole or in part, when the instructor has indicated that the assignment is to be completed on an individual basis". Please refer to the course outline statement or the instructor concerning this issue.

COVID Considerations

It is important to remember that COVID is still present in Ottawa. The situation can change at any time and the risks of new variants and outbreaks are very real. There are a number of actions you can take to lower your risk and the risk you pose to those around you including being vaccinated,

wearing a mask, staying home when you're sick, washing your hands and maintaining proper respiratory and cough etiquette.

Feeling sick? Remaining vigilant and not attending work or school when sick or with symptoms is critically important. If you feel ill or exhibit COVID-19 symptoms do not come to class or campus. If you feel ill or exhibit symptoms while on campus or in class, please leave campus immediately. In all situations, you must follow Carleton's symptom reporting protocols.

Masks. Carleton has paused the COVID-19 Mask Policy, but continues to strongly recommend masking when indoors, particularly if physical distancing cannot be maintained. It may become necessary to quickly reinstate the mask requirement if pandemic circumstances were to change.

Vaccines. Further, while proof of vaccination is no longer required as of May 1 to attend campus or in-person activity, it may become necessary for the University to bring back proof of vaccination requirements on short notice if the situation and public health advice changes. Students are strongly encouraged to get a full course of vaccination, including booster doses as soon as they are eligible, and submit their booster dose information in cuScreen as soon as possible. Please note that Carleton cannot guarantee that it will be able to offer virtual or hybrid learning options for those who are unable to attend the campus.

All members of the Carleton community are required to follow requirements and guidelines regarding health and safety which may change from time to time. For the most recent information about Carleton's COVID-19 response and health and safety requirements please see the University's COVID-19 website and review the Frequently Asked Questions (FAQs). Should you have additional questions after reviewing, please contact covidinfo@carleton.ca.

Doctor's note or medical certificate. In effect for Fall 2022 term. In place of a doctor's note or medical certificate, students are advised to complete the self-declaration form available on the Registrar's Office website to request academic accommodation for missed course work including exams and assignments. Students should also discuss with the course instructor the required accommodations arising from the COVID-19 situation.