

## COMP 4106B – Winter 2021

Artificial Intelligence

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### Course Information

Classroom: Online via Zoom (link on cuLearn)

Class times: Wednesdays & Fridays, 1:00pm – 2:30pm

Course Website: <https://culearn.carleton.ca/moodle/course/view.php?id=160469>

### Instructor

Matthew Holden ([matthew.holden@carleton.ca](mailto:matthew.holden@carleton.ca))

Office Hours Time: Wednesdays & Fridays 2:30pm – 3:30pm (or by appointment)

Office Hours Location: Online via Zoom (link on cuLearn)

### Teaching Assistants

TBD

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### Course Calendar Description

Several areas in knowledge-based systems are covered, including recent approaches to machine learning and data mining, inference methods, knowledge-based and fuzzy systems, heuristic search, and natural language processing.

### Topics Covered

- Agents and agent-based systems
- Heuristic search
- Bayes theorem and Bayesian inference
- Rule-based systems
- Reinforcement learning
- Artificial Life
- Natural language processing
- Artificial neural networks

### Prerequisites

Prerequisite(s): COMP 2804, one of COMP 2404, SYSC 3010, SYSC 3110 and one of COMP 2402, SYSC 2100.

### Course Format

This course will use a blended online format for delivery. Course content will be delivered primarily through pre-recorded videos. Scheduled class times may be used for supplementary materials and assessments. It is expected that students have watched the video(s) prior to the corresponding class. Live classes will be accessible through cuLearn and will be recorded.

## Required Textbook(s) and Other Resources

Recommended textbook:

G. Luger, *Artificial Intelligence: Structures and Strategies for Complex Problem Solving*, Pearson (Addison Wesley).

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 cuLearn.

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 cuLearn.

<i>Component</i>	<i>Weight</i>
Assignments (3)	33% (11% each)
Quizzes (3)	33% (11% each)
Project	30%
Participation	4%

### *Assignments*

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 in small groups of up to three students.

### *Quizzes*

There will be three quizzes. Each quiz will each be 60 minutes in length and take place during regularly scheduled class time. Quizzes are open-book, and you may consult your notes and the textbook during quizzes. You may not consult other people during quizzes. Quizzes must be completed individually.

### *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 in small groups of up to three students.

### *Participation*

Students may participate through (1) in-class discussion, (2) posting on cuLearn, or (3) attending instructor or teaching assistant office hours. To receive full participation marks, students must

participate in some capacity at least six different times throughout the course. A maximum of one contribution per week may be counted toward your participation grade. Alternative modes for participation may be added throughout the term.

### **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/>.

You will be given a 72-hour grace period for late submission of assignments. These hours can be divided in whichever way you want across the 3 assignments. For example, you could: (1) submit one assignment 72 hours late, (2) submit each of the 3 assignments 24 hours late, or (3) divide the hours among the assignments however you want. You do not need to contact me to use the grace period. You may NOT use the grace period for your project.

Late submissions of the assignments beyond the grace period will not be accepted. Late submissions of the project will not be accepted. Technical problems do not exempt you from this requirement, so if you wait until the last minute and then have issues with your connection, you will receive a mark of zero. 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 at least one hour in advance of the due date and time.

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### **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](mailto: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](mailto:support@scs.carleton.ca).

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## 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](mailto: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](http://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.