![Algonquin College logo]

CST8505
Artificial Intelligence Project 1

Course Outline

2025-2026

Pre-requisite(s)	N/A
Co-requisite(s)	N/A
Prepared by	Todd Kelley
Approved by	Jennifer Lexmond, Chair, ICT - Applications & Programming
Approval date	Monday, June 9, 2025
Normative hours	56.00
Grading system	A+ Through F

Applicable Program(s)	Level	Core/Elective
1535X01FWO - AI Software Development	1	Core
1535X03FWO - AI Software Development	1	Core

Land Acknowledgement

Algonquin College campuses in Ottawa, Perth and Pembroke are located on the traditional unceded, and unsurrendered territory of the Anishinàbe Algonquin People. The Algonquin People have inhabited and cared for these lands since time immemorial. We take this time to express our gratitude and respect to them and to the land for all that it has provided and will continue to provide.

As a post-secondary institution, we acknowledge the harms done to Indigenous Peoples and are committed to learning from the past. We pledge to promote healing and resilience as we move forward in partnership with the Algonquin Nations, First Nations, Métis, and Inuit Peoples in a spirit of reconciliation.

While we recognize that territorial acknowledgements are only one step in cultivating greater respect and inclusion of Indigenous Peoples, we commit to accompanying these words with actions. We are dedicated to building a future and community that is better for all.

We pledge to continue exploring and making meaningful contributions to the Truth and Reconciliation Commission of Canada's Calls to Action.

Learn more about the College's commitment to Truth and Reconciliation: https://www.algonquincollege.com/tri

Course Description

Teamwork is a highly sought-after skill in AI development. Students participate on a team working with an industry partner addressing a substantial real-world problem and its solution. This work requires detailed design subject to requirements, validation of project deliverables and efficient communication with clients. Students engage in the initial phase of the practical design and build of a year-long project. Using software development principles, students develop testing frameworks to validate that project deliverables meet requirements. Students work collaboratively on projects choosing topics from applied industrial and innovative applications.

Vocational Learning Outcomes

This course provides the opportunity for you to achieve the following outcomes:

1535X01FWO - AI Software Development

VLO 1   Analyze, design, and implement secure Artificial Intelligence (AI) software systems through the application of systematic approaches and methodologies to meet organizational needs. (T, A)

VLO 2   Develop artificial intelligence models to identify patterns, provide insights, recommend actions or perform tasks autonomously on behalf of stakeholders. (T, A)

VLO 3   Prepare and communicate analysis, reports and recommendations, in a variety of formats, for various audiences, stakeholders and purposes. (T, A, CP)

VLO 4   Conduct software development and deployment in an ethical manner that ensures data integrity, privacy, confidentiality, impartiality, transparency, equal access and no data bias. (T, A)

VLO 5   Complete all work in compliance with laws, regulations, data governance, professional ethics and industry standards. (T, A)

VLO 6   Evaluate and deploy custom-made and commercial AI software components for the purpose of integration into software solutions. (T, A)

VLO 7   Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship. (T, CP)

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Assessment Levels —T: Taught **A**: Assessed **CP**: Culminating Performance

Course Learning Outcomes / Elements of Performance

When you have earned credit for this course, you will have demonstrated the ability to:

1. Conduct discovery phase including research and stakeholder interviews to further define an applied industry problem

- Identify the stakeholders in a project
- Identify and document the project scope and goals
- Negotiate the project schedule and budget

2. Create proposed architecture for implementation of a solution

- Assess and document a description of the problems entailed by the project
- Determine a set of one or more candidate solution strategies for each project problem
- Document a proposed technical solution for each project problem

3. Use AI principles and practices to implement architecture

- Describe the stages of the MLOps lifecycle
- Assess the sources of data available to be used in problem solutions
- Determine the type of AI solution appropriate for project problems (commercial off-the-shelf, pretrained models, or custom models)
- Apply techniques such as knowledge representation, data set preparation, classificaiton, clustering, and outlier detection, as applicable to the project problems

4. Apply software development principles throughout the project

- Explain the Agile software development methodology
- Identify and document stories and tasks for problem solutions
- Manage dependencies between tasks
- Determine and document time-boxed goals for sprints
- Determine groupings of stories and tasks necessary to achieve goals of sprints
- Manage the progress of stories and tasks through their lifecycle milestones
- Analyze and document security aspects of the project

5. Conduct all activities in accordance with ethical standards

- Consider the consequences of one's choices and actions
- Use an analytical framework to analyze the project from an ethical perspective
- Document any potential ethical considerations of the project

6. Confirm solution strategy based on stakeholder requirements

- Identify and document project requirements
- Conduct reviews, walkthroughs, and inspections to validate project requirements
- Document a strategy for acceptance testing
- conduct a basic risk analysis and document a basic risk mitigation strategy

7. Work collaboratively with internal team members and external stakeholders

- Participate regularly in work sessions and discussions with team-mates and project stakeholders
- Manage effective communications
- Contribute planned deliverables on time

Learning Resources

Students are expected to consult with, and seek assistance from, other staff/faculty member in the College and industry partners (collectively: experts) when required. Students must also be respectful of time impositions on the experts.

Students are also expected to act like "Junior Employees" (or "Junior Professionals in Training") for the duration of their project. This may include being exposed to (and involved in) exit interviews, peer evaluations, the possibility of being fired from your team, providing useful feedback.

Finally, students are expected to take responsibility for the success of their project.

To access your course list, learning resources and costs, visit [Booklist](#).
Please note that a learner must be registered in a specific course or program to view this information.
Program tuition and fees can be found on the [Tuition and Fees Estimator for Full-time Programs](#) page.

Learning Activities

Keeping minutes and agendas
Engaging in discussions
Submitting questions as well as answers
Holding formal or informal debates
Examining cases
Interviewing experts
Making presentations
Peer and self-evaluations

Pre-defined Evaluation / Earning Credit

The following list provides evidence of this course's learning achievements and the outcomes they validate:

Report(s) (25%)

Validates Outcomes: CLO 1, CLO 2, CLO 3, CLO 4, CLO 5, CLO 6, CLO 7

Group Presentation(s) (15%)

Validates Outcomes: CLO 5, CLO 6, CLO 7

Quiz(zes) (10%)

Validates Outcomes: CLO 1, CLO 4, CLO 5, CLO 6, CLO 7

Self/Peer Evaluation(s) (10%)

Validates Outcomes: CLO 5, CLO 7

Midterm Exam(s) (15%)

Validates Outcomes: CLO 3, CLO 4, CLO 5

Final Exam (15%)

Validates Outcomes: CLO 3, CLO 4, CLO 5

Meeting(s) / Consultation(s) (10%)

Validates Outcomes: CLO 2, CLO 3, CLO 4, CLO 5, CLO 6, CLO 7

Prior Learning Assessment and Recognition

Students who wish to apply for Prior Learning Assessment and Recognition (PLAR) need to demonstrate competency at a post-secondary level in all outlined course learning outcomes. Evidence of learning achievement for PLAR candidates includes:

- Portfolio
- Project/Assignment
- Other: Presentation Interview

Course Related Information

You must enroll in CST8505 and CST8510 in consecutive terms. A failure in EITHER CST8505 OR CST8510 will result in retaking BOTH CST8505 AND CST8510.

Please refer to the Course Section Information (CSI) / weekly schedule for specific course-related information as provided by your professor.

Program Information

Department Information

STUDENT ACADEMIC RESPONSIBILITIES
Each student is responsible for:
• Knowing the due dates for marked out-of-class assignments.
• Attending all classes and knowing the dates of in-class marked assignments and exercises.
• Maintaining a folder of all work done in the course during the semester for validation claims in cases of disagreement with faculty.
• Keeping both paper and electronic copies of all assignments, marked and unmarked, in case papers are lost or go missing.
• Regularly checking both Brightspace announcements as well as one's Algonquin e-mail account for important messages from both professors and college administration.
• Participating in on-line and classroom exercises and activities as required.
• Retaining course outlines for possible future use to support applications for transfer of credit to other educational institutions.
Department Grading Policy - For all courses that have both a theory and practical (lab) component, students must have a grade of at least 50% (or "D-") on both the theory component as well as in the practical (i.e. lab) component in order to achieve a passing grade in the course. i.e. Even if your combined grade exceeds 50% for the entire course, if you fail either the theory component or the practical component, you will not achieve a passing grade in the course.
Lab/Practical Assessment Demonstration "Demo" Requirements - Certain courses require students to demo their work after it has been submitted. These will be scheduled by the professor and involve 1-2 rudimentary questions to assure the professor that the work submitted by the student is their own. Demos are <u>not</u> graded items - the work submitted is graded. However, where demos are required, if a student does not demo their work or if the professor deems the answers to the questions unsatisfactory, the work will not be graded (i.e. grade of 0 on the lab or practical assessment).

Department Academic Dishonesty Policy - Academic Integrity is very important to all of our faculty and administrative staff and as such, measures have been put into place to detect all forms of academic dishonesty, including plagiarism of code. If plagiarism is detected by a professor, the incident will be reported and investigated. If the findings of the investigation are that a student has submitted plagiarized work as their own, they will be subject to the following policy:

1. The first offence will result in the plagiarized assessment being assigned a grade of 0.
2. The second offence will result in the assignment of a grade of F for the course.
3. The third offence will result in removal of a student from the program of study.

Harassment/Discrimination/Violence will not be tolerated. Any form of harassment (sexual, racial, gender or disability-related), discrimination (direct or indirect), or violence, whether involving a professor and a student or amongst students, will not be tolerated on the college premises. Action taken will start with a formal warning and proceed to the full disciplinary actions as outlined in Algonquin College Policies - HR22 and SA07.

Harassment means one or a series of vexatious comment(s) (whether done verbally or through electronic means), or conduct related to one or more of the prohibited grounds that is known or ought reasonably to be known to be unwelcome/unwanted, offensive, intimidating, derogatory or hostile. This may include, but is not limited to: gestures, remarks, jokes, taunting, innuendo, display of offensive materials, offensive graffiti, threats, verbal or physical assault, stalking, slurs, shunning or exclusion related to the prohibited grounds.

For further information, a copy of the official policy statement can be obtained from the Student Association.

Violation of the Copyright Act

General – The Copyright Act makes it an offence to reproduce or distribute, in whatever format, any part of a publication without the prior written permission of the publisher. For complete details, see the Government of Canada website at http://laws.justice.gc.ca/en/C-42 . Make sure you give it due consideration, before deciding not to purchase a textbook or material required for your course.

Software Piracy - The Copyright Act has been updated to include software products. Be sure to carefully read the licensing agreement of any product you purchase or download, and understand the terms and conditions covering its use, installation and distribution (where applicable). Any infringement of licensing agreement makes you liable under the law.

Disruptive Behaviour is any conduct, or threatened conduct, that is disruptive to the learning process or that interferes with the well being of other members of the College community. It will not be tolerated. Members of the College community, both students and staff, have the right to learn and work in a secure and productive environment. The College will make every effort to protect that right. Incidents of disruptive behaviour must be reported in writing to the departmental Chair as quickly as possible. The Chair will hold a hearing to review available information and determine any sanctions that will be imposed. Disciplinary hearings can result in penalties ranging from a written warning to expulsion.

For further details, consult the Algonquin College Policies AA32, SA07 and IT01 in your Instaguide.

College Related Information

Algonquin College's policies have been developed to ensure the health, safety and security of all students, faculty and staff, and the proper and fair operation of the College as an academic institution and employer. Please refer to the Algonquin College Policies website for the most current policy information available at http://www.algonquincollege.com/policies/.

Students are especially encouraged to be aware of the following College expectations

Academic Integrity

Algonquin College is committed to the highest standards of academic integrity, and students are expected to uphold these standards throughout their learning journey with the College and post-graduation. Any academic work submitted by a student is expected to be their own work, unless designated otherwise, all human and technological assisted generated sources must be attributed. Refer to the College's Library web site for attribution support and resources. All students are expected to be familiar with the College's AA48: Academic Integrity policy which outlines student and staff roles and responsibilities, the process for addressing, determining and ruling final academic decisions regarding violations of academic integrity as well as what represents academic misconduct. Students with any questions about academic integrity course expectations including but not limited to use of technology, generative AI and other resources to support completion of coursework, are encouraged to speak to their professor and refer to the course weekly schedule, assessment instructions, course announcements and materials.

Centre for Accessible Learning (CAL)

Students with visible and/or non-visible disabilities are encouraged to register with the Centre for Accessible Learning (CAL) in order to be eligible for appropriate learning supports and/or accommodations. Students are strongly encouraged to make an appointment with the Centre for Accessible Learning as early as possible when starting a program. Once your needs are identified, a Letter of Accommodation (LOA) will be issued which you can share with your professors through the CAL Student Portal. If you are a returning student, please ensure that professors are given a copy of your LOA each semester.

Test Accommodations for Students Registered with CAL

Students who require testing accommodations will book their tests/exams through the CAL Student Portal. It is important to note the posted test/exam booking deadlines for the term. Test booking deadlines are communicated through CAL Disabilities Counsellors, CAL Testing Services, and other college wide communication. Additional information on the steps to book accommodated tests/exams with CAL Test Services can be

found at Step-by-Step Overview.

Retroactive Accommodations

Students are expected to meet evaluation and completion deadlines as stated in course outline and weekly schedule documents. In circumstances where evaluation deadlines are missed or student performance has been affected by a temporary, significant and/or unanticipated change in functional ability related to disability (including mental health), interim or retroactive accommodations may be considered. For these instances it is advised you reach out to CAL or your professors as soon as possible. For other situations where deferral of evaluations may be warranted, please consult Algonquin College Policy AA21: Deferred Evaluation.

Network Credentials and College Email

Students at Algonquin College are provided with a college email account. This is the address that will be used when the College, your professors, or your fellow students communicate important information about your program or course activities. Your network credentials can be found in the ACSIS portal and you are expected to check your Algonquin email regularly and to use it to send and receive college-related email. Students are required to maintain the privacy of their AC login credentials. Sharing network credentials poses a security risk and is subject to disciplinary action. Your responsibility to protect your login credentials is governed by the Information Security Policy IT01. Support is available through the college Information Technology Service (ITS) at: https://www.algonquincollege.com/its/

Mental Health and Wellness Supports

Canada has launched a national Suicide Helpline at www.988.ca and a wide range of mental health and wellness resources for Algonquin students are available at www.algonquincollege.com/SSS/student-health-wellness.

Student Course Feedback

Algonquin College invites students to share their course experience by completing a student course feedback survey for each course they take. For further details consult Algonquin College Policy AA25: Student Course Feedback.

Use of Mobile Devices in Class

With the proliferation of small, personal mobile devices used for communications and data storage, Algonquin College believes there is a need to address their use during classes and examinations. During classes, the use of such devices unless authorized by your professor can be disruptive and disrespectful to others. During examinations, the use of such devices is generally prohibited unless authorized by your professor. Otherwise use is considered academic dishonesty in the form of cheating. For further details consult Algonquin College Policy AA32: Use of Electronic Devices in Class

Technology Requirements

Students are required to have access to a computer and to the internet. There may also be additional technology-related resources required to participate in a course that are not included in the course materials fee, such as headphones, webcams, specialized software, etc. Details on these requirements can be found in the Weekly Schedule document of the course for each course available on Brightspace.

Transfer of Credit

It is the student's responsibility to retain course outlines for possible future use to support applications for transfer of credit to other educational institutions.

Safe Harbour

In the event of an unexpected major event (pandemic, etc.), your course may have changes that are not reflected in the Course Outline. Should this happen, the Weekly Schedule document will have updated information about your course.

Other Information

Students are required to respect the confidentiality of employer, client and/or patient information, interactions, and practices that occur either on Algonquin College premises, or at an affiliated clinical/field/co-op placement site. Concerns regarding clients, patients, and/or employer practices are to be brought to the attention of the program coordinator, or designated field/clinical/co-op placement supervisor so that they may be resolved collaboratively. Such concerns are not to be raised publically either verbally, in writing, or in electronic forums. These matters are to be addressed through established program communication pathways.