

MASTER OF ARTIFICIAL INTELLIGENCE DESIGN & DEVELOPMENT (MAI)

About the Program

The Master of Artificial Intelligence Design & Development program equips you with the expertise to excel in the fast-moving space of artificial intelligence (AI), bridging the gap between rigorous theory and real-world business solutions.

Through advanced training in machine learning, natural language processing, computer vision, ethics in AI and more, you will be prepared to develop and apply AI technologies across multiple industries. You will learn to design and refine high-performing machine learning models, evaluate conventional, auto and real-time machine learning algorithms for different use cases and generate actionable insights from deep learning models to drive business innovation.

The program offers extensive experiential learning opportunities to help you gain industry experience. You'll participate in case analyses and innovative labs, alongside an independent applied research project and eight months of internship experience.

Credential Awarded

Master's Degree

Duration

4 Semesters (16 months)

Starts

January, May, September

Program and Course Delivery

This program is offered in Seneca's hybrid delivery format with some courses available in Seneca's flexible delivery format. Some coursework is online and some must be completed in person. Students will need to come on campus to complete in-person learning requirements. For courses offered in the flexible delivery format, professors use innovative learning spaces and technology to teach students in a classroom or lab and broadcast in real time to students attending remotely. In flexible courses, students have the choice of coming on campus or learning online.

Skills

Our master's in artificial intelligence design & development will prepare you with the skills related to the following areas:

- Artificial Intelligence (AI)
- Machine Learning (ML)
- Deep Learning
- Natural Language Processing (NLP)
- Computer Vision
- Machine Learning Operations (MLOps)
- Data Science for AI
- Applied research
- Complex problem solving and analysis

- Critical thinking
- Ethics in AI
- AI Project Management

Work Experience Internship

In this program, you will have the opportunity to participate in 840 hours of work-integrated learning experience in your final two semesters of study. This can be completed either as two unique four-month internships or one eight-month internship. The internship is designed to build upon experiential and theoretical learning in an industry setting, where you will engage in the development or implementation of an AI application.

The internship can be completed in person, online or in a hybrid format, depending on the hiring organization.

Your Career

Graduates with a master's in artificial intelligence design & development can work in various industries such as technology, finance, manufacturing, sustainable and renewable energy, healthcare, aerospace, automotive and more. You can explore a variety of roles within these industries, such as:

- AI Engineer
- AI Project Manager
- AI Manager
- Data Analyst
- Data Scientist
- Deep Learning Engineer
- Lead Data Engineer
- Machine Learning Software Engineer

Program of Study

Course Code	Course Name	Weekly Hours
Semester 1		
MAI101	Machine Learning	4
MAI102	Mathematics for Machine Learning Algorithms	4
MAI103	Data Science for Artificial Intelligence	4
MAI104	Artificial Intelligence Project Management	3
MAI105	Ethics in Artificial Intelligence	3
Semester 2		
MAI201	ML Ops	4
MAI202	Deep Learning	4
MAI203	Natural Language Processing	4
MAI204	Computer Vision	4
MAI205	Artificial Intelligence Research	3
Semester 3		
MAI300	Applied Research Project I	1
MAI333	Internship 1	30
Semester 4		
MAI400	Applied Research Project II	1
MAI444	Internship II	30

Program Learning Outcomes

This Seneca program has been validated by the Credential Validation Service as an Ontario College Credential as required by the Ministry of Colleges and Universities.

As a graduate, you will be prepared to reliably demonstrate the ability to:

- Develop an optimized Machine Learning model based on the selection and hyperparameter tuning of different algorithms.
- Justify the use of conventional, auto, and real-time Machine Learning algorithms, their trade-offs, and their utility with different datasets toward business solutions for actionable decision making.
- Generate prescriptions and predictions from trained deep learning models that use data to drive optimized business solutions.
- Build high performing, scalable supervised and unsupervised models to understand the underlying patterns of data in different contexts.
- Curate and construct training data sets to reduce machine and human bias for monitoring and mitigating adverse predictions while complying with regulatory frameworks and ethical standards.
- Propose and implement creative AI based business solutions drawing from academic and applied research in related subfields.
- Extract valuable insights from complex datasets through storytelling, visualization methods, wrangling, and preparation, to make data-driven decisions that contribute to business support and success.
- Leverage statistical, mathematical, and computational methodologies in the field of artificial intelligence to extract valuable insights and generate knowledge from data sets.

- Foster and maintain a collaborative environment that highlights teamwork, engages professional communication and constructive criticism, and shares creative solutions.

Admission Requirements

- Four-year honours bachelor's degree, or equivalent*, in computer science, data science, mathematics, computer or software engineering or a related field. A minimum average of B (70%) must have been achieved overall or within the final two years of the program
- If applicable, English language proficiency. For more information, review English proficiency requirements for Canadian applicants (<https://www.senecapolytechnic.ca/registrar/canadian-applicants/admission-requirements/english-proficiency.html>) and International applicants (<https://www.senecapolytechnic.ca/international/apply/how-to-apply/admission-requirements/english-requirements.html>). Applicants with credentials from outside of Canada must provide a "course-by-course" credential assessment from a recognized agency such as WES (World Education Services) or ICAS (International Credential Assessment Service).

*Equivalency for applicants not meeting the specified admission requirements will be considered based on a combination of academic and industry/professionally related expertise. Submission of academic transcripts, a current resumé outlining relevant industry-related work experience and a letter of interest in the program will be used to assess applicants for candidacy in the master's program.

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