VANIER
CÉGEP/COLLEGE

Department of Mathematics
Faculty of Science and Technology

Course Title: Math for AI
Course Number: 201 - SND - VA
Section: 00001
Semester: Winter 2026

Instructor: I.T. Ivanov
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Webpage: gauss.vaniercollege.qc.ca/~iti/

Course Description: This course introduces the essential mathematical pillars of artificial intelligence, specifically focusing on probability theory, multivariable calculus, and optimization algorithms. Students will learn to translate high-dimensional data into computational models, providing the theoretical framework necessary to understand how neural networks learn and evolve.

Ponderation: Theory 2 hours. Lab 2 hour. Homework 2 hours.

Prerequisites: Differential Calculus 201-SN2-RE

Teaching Methods: A combination of lectures, class and lab exercises, along with homework and classwork will prepare the students for two tests. To illustrate the machine learning and AI models and algorithms machine learning software will be introduced and used in the course.

Course Materials: Materials for this course can be accessed on the course webpage:
gauss.vaniercollege.qc.ca/~iti

Additional Expenses: Scientific calculator. Laptop will be very useful and could be borrowed from the library.

Office Hours: By appointment.

Competencies: For the course objectives and expected learning outcomes, please consult the course framework which will be uploaded on Lea.

Approximate Date of Evaluations: The **Midterm** test will take place in week 7. The **Final exam** will be scheduled for the last week of classes. In class exercises and labs will be due every week.

LIA (Learning Integration Assessment): The LIA for this course is student project.
Evaluation: Your final mark will be computed as the better mark from the following two grading schemas:

	Schema 1	**Schema 2**
Midterm	**30%**	**30%**
Final Exam	**35%**	**10%**
Exercises and Labs	**25%**	**25%**
Student project	**10%**	**35%**

Classroom Policies:

1. Students who miss a class, test, or assignment for medical reasons must declare their absence by completing the College's online Medical Absence form. A screenshot of the completed form must be sent via MIO to all affected teachers, ideally on the same day of the absence and no later than 48 hours afterwards.

2. Make-up assessments must normally be written within one week of the student's return, unless otherwise arranged with the teacher. Delaying a make-up beyond this period without valid justification may result in the assessment being marked as a zero. Writing the make-up promptly ensures timely feedback and prevents the workload from accumulating at the end of the semester.

3. Attendance is highly recommended. It is the student's duty to remain informed about what takes place in class he/she misses. Absence from class does not excuse students from their responsibilities.

4. Students are expected to check the course Webpage on a regular basis. Course material, announcements, and important dates will be posted there.

5. For on paper exercises: handwritten solutions with detailed explanations as to how you arrived at the answer are expected.

6. Communication via MIO/email: students can generally expect a response within 24-48 hours during the hours of 9 AM and 5 PM, Monday to Friday.

Course Policies:

It is the student's responsibility to be familiar with and adhere to the Vanier College Academic Policies. The complete policies can be found on the Vanier College website, under Policies. Students should pay particular attention to the Institutional Policy on the Evaluation of Student Achievement (IPESA). The IPESA aims to clarify the structures and means that ensure the fair and equitable evaluation of student achievement, including the conditions for learning, assessment, and certification.

Section 11.4 of IPESA provides details on **Academic Integrity**, which is an essential component of any educational institution and all students are expected to uphold the highest standards of academic integrity during their college studies. Failure to do so may result in serious consequences – please see section 11.4.2 on **Academic Misconduct**. There are many resources available to support academic integrity in your courses. If you have a problem that you have been unable to resolve by talking with your teacher, please reach out to the Student Advocate or to a Faculty Dean's office (A-286, B-208, N-301). For Continuing Education courses, students can visit E-115.

Student Academic Complaints (Policy number 7210-8) The Vanier College Student Academic Complaints Policy and procedures puts an emphasis on mediation as the primary means to resolve complaints in the academic area. If you have a problem with a teacher and have been unable to resolve it by talking with him or her, you may wish to enlist the help of the Faculty Mediation Committee. The committee member names and contact information are available in Student Services or through the office of the Faculty Dean.

Department Coordinator : Stephen Newbigging newbiggs@vaniercollege.qc.ca

Faculty Dean: Haritos Kavallos kavalloh@vaniercollege.qc.ca