

**MATH1104D**  
**Linear Algebra for Engineering or Science Winter 2020**

**Instructor:** Mathieu Lemire  
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**Lectures:** Tuesdays and Thursdays from 11:35 to 12:55 at room 301 Azrieli Theater. The first class is on January 7th.

**Tutorials:** On Fridays from 10:35 to 11:25. Beginning on January 17th. Tutorials will consist of a problem solving session and you are highly encouraged to attend. Attending tutorials will count for 5 % of your final mark. For your tutorials or tests, **make sure to go to the section that you have been allocated to (see cuLearn for more details)**. The following table indicate the location of each tutorial section: TBD

Section	Room	TA's name	TA's connect email
D1	502 SA	Brian Lin	brianlin@cmail.carleton.ca
D2	406 SA	Amanda Chafee	AmandaChafee@cmail.carleton.ca
D3	516 SA	Xiaoying Liu	xiaoyingliu@cmail.carleton.ca
D4	402 SA	Dinesh Dawonauth	dineshdawonauth@cmail.carleton.ca
D5	238 TB	Joel Valentino	joeyvalentino@cmail.carleton.ca

**Office hours:** Tuesdays from 13:00 to 15:00 and Thursdays from 10:00 to 11:00. All my office hours are held in my office (5250HP).

**Textbook:** Linear Algebra and its Applications by Lay, Lay & McDonald, 5th edition. Previous editions are also fine. Note that some supplementary material will also be posted at times on cuLearn.

**Prerequisites:** Ontario Grade 12 Mathematics: Advanced Functions; or MATH 0005, or equivalent; or permission of the School.

**Evaluation:** Your final grade will be calculated as:  
Term Mark 45% (best 2 out of 3 tests) + Tutorials 5% + Final Examination 50%

**Term Mark:** There will be three 50-minute tests administered during tutorials on **January 31st, February 28th** and **March 20th**. **No make up, early or delayed tests will be given**. Students are allowed to miss one test without penalty as we only count the best 2 out of 3 tests.

**Final exam:** The final exam is a cumulative three hours closed book exam scheduled by the university. The exam period runs from April 13th to April 25th (including Saturdays and Sundays). It is student's responsibility to be available at the time of the examination. In particular, no travel plans should be made until the examination schedule is published. It is the students responsibility to find out the correct date and time of the exam and the room where it takes place. To pass this course, a student must obtain at least 50

**Calculators:** Only calculators that are non-scientific (so basically a calculator that can only do basic arithmetic operations) are allowed. Such calculators can usually be purchased for very cheap. I reserve the right to confiscate any calculator during a test or a final exam.

**Practice problems lists** Practice problems lists will regularly be posted on cuLearn. These problems are not to be handed in and will not be graded. However, in order to succeed in the course, it is absolutely essential to practice on a regular basis.

**Withdrawal:** The last day for academic withdrawal is **April 7th**.

**Students with Disabilities:** Students with disabilities who require academic accommodations in this course are encouraged to contact the Paul Menton Centre for Students with Disabilities to complete the necessary Letters of Accommodation. After registering with the PMC, make an appointment to meet with me and discuss your needs in order to make the necessary arrangements as early in the term as possible. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable).

**Notes:**

1. The best two of the three tests will be used to determine the test component of your final mark.
2. Problem lists, comments, solutions and other informations will regularly be posted on cuLearn. It is your responsibility to look on cuLearn to obtain these informations.
3. Coming to class is very important and I strongly encourage you to do so.
4. It is each student's responsibility to collect the marked tests from the TA. The test papers are normally distributed in the tutorial session following the date of the test.
5. To pass the course a student must obtain at least 50 % as his final mark.
6. Students who missed the final examination may be eligible for a deferred exam, provided that they present a doctor's note or another supporting document to the Registrars Office. It is the Registrars Office (not the course Instructor!) which makes the decision of granting a deferred examination. After the deferred exam is written, any questions should be directed to the School of Mathematics and Statistics and not to the Instructor.
7. **Pregnancy accommodation:** write to me 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 the Equity Services webpage.
8. **Religious obligation:** write to me 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 the Equity Services webpage.

**Extra available help:** For extra help in mathematics, on top of my office hours, I would suggest to you to also consider the following services available at Carleton:

**Math Tutorial Center** The Math Tutorial Centre (MTC) (located at 3422 HP) is study space for any student who wishes to study mathematics individually or in group while receiving support from one of our mathematics teaching assistants (TA). For more details and to consult the opening hours, please look at: <http://carleton.ca/math/math-tutorial-centre/>

**Math and Stats Learning Assistance Program (MS-LAP)** Math and Stats Learning Assistance Program (MS-LAP) supports first year mathematics and statistics courses. This free of charge program helps students achieving their goals. It provides learning support and solutions to homework questions through assistance videos and virtual office hours. These services are available on cuLearn. For more details please consult: <https://carleton.ca/math/math-learning-assistance-program/>

List of Topics (the order may be changed at time during the term)

- Systems of linear equations
- Reduced row echelon form and Gauss-Jordan elimination
- Matrix operations, matrix inverse
- Determinants, including Cramer's Rule
- Subspaces of  $R^n$ , including null space and column space
- Spanning sets, linear independence
- Bases and dimension
- Linear transformations, including the standard matrix
- Eigenvalues, eigenvectors, and diagonalization
- Complex numbers including De Moivre's theorem and complex eigenvalues
- Inner product, including length and orthogonality
- Orthogonal bases, including Gram-Schmidt

For a list of topics covered on a given week, please consult the practice problems list of that list that will be posted on cuLearn during the term.