MATH 1104A Linear Algebra for Engineering or Science, Fall 2022
(Course outline, subject to change, updated August 30, 2022)

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Office hours: TBA

Textbook: Linear Algebra and its Applications, Sixth Edition, David C. Lay, Steven R. Lay, and Judi J. McDonald.

A link to purchase the e-text from the publisher's website (Pearson) will be posted on the course Brightspace page.

Prerequisite: Ontario Grade 12 Mathematics: Advanced Functions, or MATH 0005, or equivalent, or permission of the school.

Calendar description: Systems of linear equations, matrix algebra, determinants, invertible matrix theorem, Cramer's rule. Vector space R^n, subspaces, bases. Eigenvalues, diagonalization. Linear transformations, kernel, range. Complex numbers (including De Moivre's theorem). Inner product spaces and orthogonality. Applications.

Lectures: Tuesdays and Thursdays 1:05pm-2:25pm in Azrieli Theatre 102. Lectures begin on Thursday September 8, 2022, and end on Thursday December 8, 2022.

Tutorials: Thursdays 3:35-4:25pm. Tutorials start on Thursday September 22, 2022, and end on Thursday December 8, 2022. When there are no tests, the TAs will hold problem-solving sessions and answer questions from students.

Class conduct: Students are expected to always behave in a professional manner. Disrupting a class or a tutorial is an Instructional Offence (see University Calendar).

Term tests: There will be four 50-minute tests written in person during tutorial hours on the scheduled dates. Students are expected to write all the tests. Missing/Unwritten tests will be counted as zero. There is no virtual alternative to writing the tests.

Final exam: There will be a cumulative 3-hour closed-book in-person final exam scheduled by the university during the usual exam period. It is the responsibility of each student to be available at the time of the final examination.

Evaluation:
Four tests: 50% (each worth 12.5%)
Final exam: 50%
To pass the course: You must obtain
(i) at least 15/50 marks from the tests,
(ii) at least 15/50 marks from the final exam, and
(iii) at least 50/100 marks on the total course grade.

MATH 1104A Lecture Schedule

Dates	Sections	Tests	Topics
Sep 8	1.1		Systems of Linear Equations
Sep 13, 15	1.2 1.3, 1.4, 1.5		Echelon Forms of a Matrix Vectors in **R^n** and Matrix Equation **Ax = b**
Sep 20, 22	1.7 1.6, 1.10		Linear Independence of Vectors in $\mathbf{R}^n$ Applications of Linear Systems
Sep 27, 29	1.8 1.9	Test 1	Linear Transformations The Matrix of a Linear Transformation
Oct 4, 6	2.1 2.2		Matrix Operations The Inverse of a Matrix
Oct 11, 13	2.3 2.8		Characterizations of Invertible Matrices Invertible Linear Transformations Subspaces of $\mathbf{R}^n$
Oct 18, 20	2.8 2.9	Test 2	Basis for a Subspace Rank of a Matrix
Oct 24--28			FALL BREAK (NO CLASSES)
Nov 1, 3	3.1 3.2		Introduction to Determinants Properties of Determinants
Nov 8, 10	3.3 5.1, 5.2		Cramer's Rule Eigenvectors and Eigenvalues
Nov 15, 17	5.3 Appendix B	Test 3	Matrix Diagonalization Complex Numbers
Nov 22, 24	Lecture Notes 5.5		De Moivre's Theorem Complex Eigenvalues
Nov 29, Dec 1	6.1 6.2	Test 4	Inner Product and Orthogonality Orthogonal Sets
Dec 6, 8	6.3 6.4		Orthogonal Projections Gram-Schmidt Orthogonalization Process

MATH 1104A Teaching Assistants

Section	Room	Teaching Assistant	Email: @cmail.carleton.ca
A1		TBA	
A2		TBA	
A3		TBA	
A4		TBA	

Important notes:

- Please use your Carleton e-mail account for all course-related e-mails.
- You are responsible for keeping up with information announced during the lectures and tutorials, or sent to your Carleton e-mail account, or announced on Brightspace.
- All materials created for this course (including lecture notes, tutorials and tests) are the intellectual property of the instructor, Şaban Alaca. They are intended for personal use only and may not be reproduced or redistributed without prior written consent of the instructor.
- Be sure that you know the academic integrity standards at Carleton, which can be found at https://carleton.ca/secretariat/wp-content/uploads/Academic-Integrity-Policy.pdf

Policies for academic accommodations:

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Academic accommodations for students with disabilities: The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or https://carleton.ca/pmc/ for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test requiring accommodation. After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. For the deadline to request accommodations for the formally-scheduled exams, visit the PMC website https://carleton.ca/pmc/

Religious obligations and/or accommodations for pregnancy: Write to me with any requests for academic accommodations 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 student guide at https://carleton.ca/equity/accommodation/academic/students/

COVID-19:

COVID is still present in Ottawa. The situation can change at any time and the risks of new variants and outbreaks are very real. You can take a number of actions to lower your risk and the risk you pose to those around you including being vaccinated, wearing a mask, staying home when you're sick, washing your hands, and maintaining proper respiratory and cough etiquette.

Feeling sick? Remaining vigilant and not attending work or school when sick or with symptoms is critically important. **If you feel ill or exhibit COVID-19 symptoms, do not come to class or campus. If you feel ill or exhibit symptoms while on campus or in class, please leave campus immediately.** In all situations, you must follow Carleton's symptom reporting protocols.

Masks: Carleton has paused the COVID-19 Mask Policy, but continues to strongly recommend masking when indoors, particularly if physical distancing cannot be maintained. It may become necessary to quickly reinstate the mask requirement if pandemic circumstances were to change.

Vaccines: Further, while proof of vaccination is no longer required as of May 1 to attend campus or in-person activity, it may become necessary for the University to bring back proof of vaccination requirements on short notice if the situation and public health advice changes. Students are strongly encouraged to get a full course of vaccination, including booster doses as soon as they are eligible, and submit their booster dose information in cuScreen as soon as possible. Please note that Carleton cannot guarantee that it will be able to offer virtual or hybrid learning options for those who are unable to attend the campus.

All members of the Carleton community are required to follow requirements and guidelines regarding health and safety which may change from time to time. For the most recent information about Carleton's COVID-19 response and health and safety requirements, please see the University's COVID-19 website and review the Frequently Asked Questions (FAQs). Should you have additional questions after reviewing, please contact covidinfo@carleton.ca.