MATH1107B Linear Algebra I, Winter 2021 Course Outline

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Textbook: Linear Algebra and its Applications (**with MyLab Access Code**), Sixth Edition, David C. Lay, Steven R. Lay, and Judi J. McDonald. E-Textbook with MyLab Access Code is available from the university bookstore.

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

Calendar description: Systems of linear equations; vector space of n-tuples, subspaces, bases; matrix transformations, kernel, range; matrix algebra and determinants. Dot product. Complex numbers (including De Moivre's theorem and n-th roots). Eigenvalues, diagonalization and Applications.

Course modality: This course is an online course where there is a mixture of synchronous meetings and asynchronous activities. This means students need to be prepared to meet some of the time online via web conferencing tools at scheduled days and times.

Lectures: Course notes and instructional videos will be posted weekly on cuLearn. You may review the content on your own time, this part of the course is asynchronous.

"Ask Me Anything" Sessions (online via Zoom): I will be hosting one live session every week to summarize the concepts in the notes and answer any questions you may have. This session *does not* replace the notes and instructional videos but is a complement. Those sessions will be held on Thursdays 8:35 - 9:55 EST. Because the last week of class does not have a Thursday, I will host a final Session on Tuesday April 13th 8:35 - 9:55 EST.

Tutorials (online via BigBlueButton or Zoom): Tuesdays 13:35 - 14:25 EST. During the tutorials, a TA will work on selected exercises and answer your questions.

Office Hours (online via BigBlueButton or Zoom): Wednesdays 16:00 - 17:00 EST (subject to change). Book your appointment on the course page in cuLearn.

Class Conduct: Students are expected to have a respectful attitude towards their classmates, TA and instructor when interacting online: https://carleton.ca/online/online-learning-resources/netiquette/. Any disruption of the course is considered to be an Instructional Offence.

Evaluations:

Eight online quizzes (best 6 out of 8)	15%
Two assignments	25%
One online midterm	25%
One online final exam	35%

Important Note. All the quizzes, midterm and final exam will be on MyLab. Therefore, it is a **necessity to purchase the textbook with the access to MyLab**. The two assignments will be submitted via cuLearn.

Quizzes: There will be eight online quizzes on MyLab throughout the semester. Each quiz will be posted on a Wednesday at 12:00 EST and due the following Friday at 17:00 EST. The average of your 6 highest quizzes will be taken to make up the grade for the quizzes. No make-up, early or late quiz will be given. Missing a quiz will be counted as zero. If you miss a quiz for medical reasons, an official medical note must be presented.

Assignments: There will be two assignments that need to be submitted via cuLearn, due on Friday February 12th and Friday March 26th. Each assignment will be posted in cuLearn at least one week before its due date. There will be no quiz on the weeks during which assignments are due.

Online midterm exam: There will be an 80-minute online midterm exam on MyLab during the class time on Thursday March 4th from 8:35 until 9:55 EST. No make-up, early or late midterm exam will be given. Missing the midterm exam will be counted as zero. If you miss the midterm exam for medical reasons, an official medical note must be presented.

Online final exam: There will be a 3-hour online **cumulative** final exam on MyLab 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.

Important Notes:

- All announcements, notes, videos, and instructions related to the course will be posted on cuLearn. There will be posted instructions for each week of class, and it is the student's responsibility to remain up-to-date with the content posted on cuLearn.
- 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
- Please post your general questions pertaining to the course in the designated discussion forum in cuLearn. This will ensure that all students are kept up-to-date with course related information. For questions that are specific to you, please use your Carleton email address and add "MATH1107B" to the subject line when contacting me by email.
- Web conferencing sessions in this course may be recorded and made available only to those within the class. Sessions may be recorded to enable access to students with internet connectivity problems, who are based in different time zones, and/or who have conflicting commitments. If you wish not to be recorded, you need to leave your camera and microphone turned off. You will be notified at the start of the session if it is being recorded.
- All course materials, including notes, outlines, recordings and other materials, are copyright protected and remain the intellectual property of their respective author(s). Students registered in the course may take notes and make copies of course materials for their own educational use only. Students are not permitted to reproduce or distribute lecture notes and course materials publicly for commercial or non-commercial purposes without express written consent from the copyright holder(s).

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 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 accommodation for pregnancy: 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 see the student guide at https://carleton.ca/equity/accommodation/academic/students/

Survivors of Sexual Violence: As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: https://carleton.ca/sexual-violence-support/

Accommodation for Student Activities: Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor 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, see the policy by visiting the website: https://students.carleton.ca/course-outline/#accommodation-for-student-activities

MATH1107B - Tentative Schedule

Week	Textbook Sections	Topics	Important Activities/Tasks
Jan 10 -16	1.1 1.2	Systems of linear equations Row Reduction and Echelon Forms	Ask Me Anything (Jan 14)
Jan 17 - 23	1.3, 1.4 1.5	Vector Equations, Matrix Equations Solution Sets of Linear Systems	Tutorial (Jan 19) Ask Me Anything (Jan 21) Quiz 1 (due Jan 22)
Jan 24 - 30	1.6 1.7	Applications of Linear Systems Linear Independence	Tutorial (Jan 26) Ask Me Anything (Jan 28) Quiz 2 (due Jan 29)
Jan 31 - Feb 6	1.8, 1.9 1.10 2.1	Introduction to Linear Transformations The Matrix of a Linear Transformation Matrix Operations	Tutorial (Feb 2) Ask Me Anything (Feb 4) Quiz 3 (due Feb 5)
Feb 7 - 13	2.2 2.3	The Inverse of a Matrix Characterization of Invertible Matrices	Tutorial (Feb 9) Ask Me Anything (Feb 11) Assignment 1 (due Feb 12)
Feb 14 - 20	Winter Break - No Classes!		
Feb 21 - 27	2.8	Subspaces of $\mathbf{R}^n$	Tutorial (Feb 23) Ask Me Anything (Feb 25) Quiz 4 (due Feb 26)
Feb 28 - Mar 6	2.9	Dimension of a Subspace Rank of a Matrix	Tutorial (March 2) Midterm (due March 4)
March 7 - 13	3.1 3.2 3.3	Introduction to Determinants Properties of Determinants Cramer's Rule	Tutorial (March 9) Ask Me Anything (March 11) Quiz 5 (due March 12)
March 14 - 20	5.1 5.2 5.3	Eigenvectors and Eigenvalues The Characteristic Equations Diagonalization	Tutorial (March 16) Ask Me Anything (March 18) Quiz 6 (due March 19)
March 21 - 27	Appendix B Lecture Notes	Complex Numbers	Tutorial (March 23) Ask Me Anything (March 25) Assignment 2 (due Mar 26)
Mar 28 - Apr 3	5.5 6.1	Complex Eigenvalues Inner Product, Length, Orthogonality	Tutorial (March 30) Ask Me Anything (April 1) Quiz 7 (due April 2)
April 4 - 10	6.2	Orthogonal Sets	Tutorial (April 6) Ask Me Anything (April 8) Quiz 8 (due April 9)
April 13		Course Review	Ask Me Anything (April 13) Tutorial (April 13)

*Each quiz will be posted on Wednesday at noon, and due Friday at 5pm EST.

**Each assignment will be due on Friday at 5pm EST and will be posted at least one week before its due date.