

MATH 1104E Linear Algebra for Engineering or Science, Winter 2021

Instructor: Professor I. S. PRESSMAN

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eTextbook: Linear Algebra and its Applications (**with MyLab Access Code**), 6'th Edition. David C. Lay, Steven R. Lay & Judi J. McDonald. Available from PEARSON ONLINE.

IMPORTANT: You must register for MyLab since homework, and possibly tests AND EXAMS, will be done using this software. IT IS CRUCIAL that you only register with your CARLETON email address. INSTRUCTIONS will be posted on CuLearn.

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 \mathbb{R}^n , subspaces, bases. Eigenvalues, diagonalization. Linear transformations, kernel, range. Complex numbers (including De Moivre's theorem). Inner product spaces and orthogonality. Applications.

•**IMPORTANT:** Please download the ZOOM APP to your computer/laptop/device & register with ZOOM using your CARLETON email address! You will not be able to join otherwise.

Tutorials:

Thursday 10:30-1130. Tutorials start Jan. 14, 2020. The first tutorial is special and highly recommended. You will be introduced by the instructor to software tools (MyLab, etc.)

Midterm test:

The MIDTERM will be in our THURSDAY time slot 8:30-10:00 FEB 25.

It will consist of all material covered before the Winter Break. The table below is a guideline and subject to change.

If you miss the midterm exam for medical reasons, a medical note must be presented.

Online final exam:

There will be a 3-hour online final exam scheduled during the usual exam period. It is the responsibility of each student to be available at the time of the final examination.

E-mail communication with instructor:

Please only use your Carleton e-mail account for all course related e-mails.

PLEASE put MATH1104 at the beginning of your email header.

Announcements:

You are responsible for keeping up with information announced during the lectures and tutorials, or sent to your Carleton e-mail account, or announced in CULearn.

Office hours: Thursday 9-10 Thursday 11:30-12:30
Please make an email appointment for a ZOOM meeting.

Grading Scheme:

10% Online homework
25% Assignments
25% Midterm Test (one- date to be announced)
40% Final exam (date to be announced)

IMPORTANT! Minimal TECHNICAL REQUIREMENTS FOR ONLINE LEARNING:
<https://carleton.ca/its/help-centre/faq-technical-specs-for-new-students/>

Academic Accommodation:

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 for a formal evaluation at 613-520-6608 or submit the form <https://carleton.ca/registrar/wp-content/uploads/self-declaration.pdf> .

If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of term, and no later than 2 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/registrar/special-requests/deferral>

Religious obligations and/or accommodation for pregnancy:

Please e-mail me with any requests for academic accommodation during the first 2 weeks of classes, or as soon as possible should the need for accommodation arise. For more information please see the guide at <https://carleton.ca/equity/accommodation/academic/students/>

Important notes:

- 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>
- You are responsible for keeping up with information announced during the lectures and tutorials, or sent to your Carleton e-mail account, or announced in cuLearn.
- If you are physically in a different time zone, please email me (using your Carleton email account) during the first week of classes with the details of your time zone to discuss suitable accommodation.
- Instructions on how to join the Zoom sessions will be posted on cuLearn.
- More details for lectures, tutorials and office hours will be posted on cuLearn.
- **Lectures: Tues. 8:30-10:00 Please don't miss the 1st class Tuesday JAN 12, 2021**

After week 1 the course will be as follows:

I will post asynchronous lectures each week on CuLearn (Topic 1 in CuLearn will be week 1 material, Topic 2 week 2, etc.) In addition, we will hold a class weekly on TUESDAY's at 8:35-10:30 live on ZOOM, where the week's topics will be expounded, problems solved, and questions answered. You are expected to have seen the week's asynchronous lecture BEFORE the live ZOOM meeting.

You MUST keep up in order to do the weekly MyLab homework. These Tuesday ZOOM meetings will be recorded for those in other time zones. On addition there will be tutorials each Thursday at 10:30 to solve problems with the help of the TAs.

Students are expected to study the assigned pages of the lecture notes and the relevant sections of the textbook before each class. During online lectures, you will have an opportunity to ask questions. The online classes are not a substitute for studying the lecture notes and the relevant sections of the textbook by yourself prior to each class. Subsequent lectures will be asynchronous & posted on the ZOOM cloud. Classes end APRIL 14.

MATH 1104A Tentative Lecture Schedule:

	DATES:	SECTION	TOPICS
Week			
1	January 12	1.1 1.2	Systems of Linear Equations. Solutions. Echelon Forms.

2	January 19	1.3 1.4 1.5	Vector Equations, The Matrix Equation $Ax = b$
3	January 26	1.6 1.7 1.10	Solution Sets of Linear Systems. Applications.
4	February 2	1.8 1.9 2.1	Linear Independence. Matrix Operations.
5	February 9	2.2 2.3	Characterizations of Invertible Matrices.
6	February 16		Winter Break. No Classes
7	Feb 23 & 25	2.8	Subspaces of \mathbb{R}^n Dimension. MIDTERM
8	March 2	2.9	Dimension. Rank of matrices.
9	March 9	3.1 3.2 3.3	Determinants & their Properties. Cramer's rule.
10	March 16	5.1 5.2	Eigenvectors, eigenvalues & characteristic equation
11	March 23	5.3	Diagonalization Complex Numbers
12	March 30	Appendix B, 5.5	Complex Numbers. Complex Eigenvalues.
13	April 6	6.1 6.2	Dot product. Length & Orthogonality. Orthogonal Sets.
14	April 13	6.3	Orthogonal Projections. Review
	FINAL EXAM		DATE TO BE ANNOUNCED

The above class outline is subject to change and intended for guidance in reading.

Teaching Assistants (TA's) & Office hours to be announced.