

MATH 1104, Sections H, Winter 2021**Linear Algebra: for Engineering or Science****Instructor:**

Jialiang Li

Office: Herzberg Building, Room 5260E-mail: lijiang@math.carleton.ca**Textbook:**Linear Algebra and Its Applications, 5rd Edition, David C. Lay

Prerequisite: Ontario Grade 12 Mathematics: Advanced Functions, or MATH 0005, or equivalent, or permission of the School. Restricted to students in the Faculty of Engineering, the School of Computer Science, or in certain B.Sc. and B.A.S. programs where specified. Please speak to the instructor if you are uncertain about your background.

Classes: Tuesday 18:05-19:25 and Thursday 18:05-19:25. Room: Zoom class.

Classes begin: Jan 11, 2021.

Classes end: April 14, 2021.

Office hours: Monday 16:00 – 17:00, Wednesday 16:00 – 17:00, at online Zoom.

Tutorials: Thursday 19:35-20:25, It will be online tutorial class.

Last Name	A - G	H- O	P - Z
Class	H1	H2	H3

Term mark: There will be 8 quizzes, 2 assignments, 1 midterm exam to make up the term mark.

No makeup, early or late midterm exam will be given. Any missing midterm exam will be counted as zero. The remaining tutorial hours will be used for the TAs to solve problem. The average of the best 5 out of 8 quizzes will count for 10%, the 2 assignments for 25% and the midterm exam for 25% to make up the 60% term mark.

Evaluation: Quiz 10%
Assignment 25%
Midterm 25%
Final Exam 40%

Final Examination: There is a 3-hour exam scheduled by the University and it will take place sometime during the examination period: **April 16 - 28, 2021 (including Saturdays)**. It is the responsibility of

each student to be available at the time of the examination. In particular, no travel plans for the examination period in April should be made until the examination schedule is published.

Notes:

- Students who do not have a passing term mark (30 out of 60) and are absent on the final examination will be assigned the grade of **FND** – “**Fail No Deferral**”. This means that the student is not eligible to write a deferred examination. Exceptions to this rule may be made at the discretion of the instructor.
- Students who fail to achieve a passing final exam grade (20/40) will be assigned a letter grade of **F**. Exceptions to this rule may be made at the discretion of the instructors.
- Students who need to miss a quiz, assignment or midterm exam must inform the instructor prior to the event and provide the picture of the original hardcopy of any supporting documentation within five business days of the event date. Students who fail to follow these instructions will receive a grade of 0% for that event.

Homework:

A list of selected exercises, mainly from the text, will be given. These exercises are not to be handed in and will not be graded. However, to succeed in the course it is **absolutely essential** that you do the exercises on a regular basis.

Calculators:

You may use a non-programmable calculator for the examinations and tests in this course.

I reserve the right to disallow any calculator.

Withdrawal: The last day to withdraw from the course is January 31, 2021.

Students with Disabilities: The Paul Menton Centre (PMC) provides services to students with Disabilities. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca 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/exam requiring accommodation. After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made.

March 19, 2021 is the last day to submit, to the Paul Menton Centre for Students with Disabilities, Formal Examination Accommodation Forms for final examinations.

Announcements You are responsible for keeping up with information announced in class or the message sent to your Carleton e-Mail account. The course schedule on the next page is approximate and may change subject to the progress of the class. The material covered on each quiz, assignment and midterm will be announced in class one week before.

MATH 1119H Tentative Course Schedule

WEEK	DATES	TESTS	SECTIONS	TOPICS
1	Jan 12 -14	~	1.1	Systems of Linear Equations,
2	Jan 19- 21	~	1.2	Row Reduction and Echelon Forms
3	Jan 26 - 28	~	1.3, 1.4	Vector Equations, The Matrix Equation $\mathbf{Ax} = \mathbf{b}$
4	Feb 2 - 4	Test 1 Sep 27	1.5, 1.6	Solution Sets of Linear Systems, Leontief Exchange Model
5	Feb 9 - 11	~	1.7, 1.8, 1.9, 1.10	Linear Independence, Introduction to Linear Transformations The Matrix of a Linear Transformation
6	Feb 16 - 18		Winter break	
7	Feb 23 - 25	Test 2 Oct 18	2.1, 2.2	Matrix Operations, The Inverse of a Matrix
8	Mar 2 - 4	~	2.3, 2.8,	Characterization of Invertible Matrices, Subspaces of R^n
9	Mar 9 - 11	~	2.9, 3.1, 3.2	Dimension of a Subspace Rank of a Matrix. Determinants
10	Mar 16 - 18	Test 3 Nov 8	3.3, 5.1, 5.2, 5.3	Cramer's Rule, Eigenvectors and Eigenvalues, The Characteristic Equation, Diagonalization
11	Mar 23 - 25	~	Appendix B Lecture Notes	Complex Numbers
12	Mar 30-Apr1	Test 4 Nov 22	5.5, 6.1	Complex Eigenvalues, Inner Product, Length and Orthogonality

13	Apr 6-8	~	6.2, 6.3	Orthogonal Sets Orthogonal Projections
14	Apr 13			Final Exam Review

Practice Problems for MATH 1104H Linear Algebra I, Winter 2021

Chapter 1

Section 1.1: # 3, 7, 11, 15, 17, 19, 21, 23, 27, 31.

Section 1.2: # 1, 3, 7, 11, 13, 17, 21, 23, 25, 33.

Section 1.3: # 1, 5, 7, 9, 11, 13, 17, 21, 23, 25.

Section 1.4: # 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 23, 35.

Section 1.5: # 1, 5, 7, 11, 17, 23.

Section 1.6: # 1, 3, 11, 12.

Section 1.7: # 1, 5, 9, 11, 13, 15, 17, 21, 23, 27, 31, 33, 35.

Section 1.10: # 1, 3, 13.

Chapter 1, Supplementary Exercises: # 1, 5, 17.

Chapter 2

Section 2.1: # 1, 3, 5, 7, 9, 11, 17, 27.

Section 2.2: # 1, 3, 5, 7, 9, 13, 15, 17, 19, 23, 25, 29, 31, 33, 37.

Section 2.3: # 1, 3, 5, 11, 13, 15, 17.

Section 2.8: # 1, 3, 5, 7, 11, 15, 19.

Section 2.9: # 3, 5, 7, 9.

Chapter 3

Section 3.1: # 1, 5, 9, 13, 15, 17, 19, 21, 23, 25, 27, 29, 37.

Section 3.2: # 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29.

Section 3.3: # 1, 3, 5, 7, 9, 11, 13, 15.

Chapter 3, Supplementary Exercises: # 1, 3, 5.

Chapter 5

Section 5.1: # 3, 5, 7, 9, 17, 21.

Section 5.2: # 1, 5, 7, 9, 16, 21.

Section 5.3: # 3, 5, 7, 9, 17, 20.

Section 5.5: # 3, 5, 7, 9, 13, 15, 19.

Chapter 6

Section 6.1: # 3, 5, 7, 9, 13, 15, 19.

Section 6.2: # 3, 5, 7, 9, 13, 15, 19.

Section 6.3: # 3, 5, 7, 9, 13, 15, 16.