

# MATH1104, Linear Algebra

## Summer 2018

**When:** Mondays-Wednesdays 6:35 pm - 7:55 pm (Main sessions) and Wednesdays 5:35 pm - 6:25 pm (TA sessions)

**Where:** Southam Hall 518 and TA sessions: Southam Hall 402 (A1) and Southam Hall 516 (A2)

**Webpage:** CULearn page of the course

### Instructor:

Mahmood Alaghmandan

**Email:** mahmood.alaghmandan@carleton.ca

**Office:** Herzberg Laboratories Room 4330

**Office Hours:** Mondays 5:30 pm - 6:30 pm

Students may also make appointments if the posted hours do not fit their schedule.

### Sessions plan:

Every lecture session of the course (unless otherwise is specified) is dedicated to teaching. TA sessions will be conducted by teaching assistants. There will be a one hour tutorial each week. Except for the three test weeks, the tutorials will be devoted to problem solving. Please make sure to always go to the tutorial section you are registered in.

### Reference:

The main source of the course is the following book. T

- ♣ David C. Lay, Steven R. Lay, and Judi J. McDonald, Linear Algebra and Its Applications (5 edition), Pearson, 2014.

For interested students, I recommend that they look at the following book. You do not need to buy it.

- Sheldon Axler, Linear Algebra Done Right, Springer, 2014.

The later can be downloaded for free on the campus WiFi from here:

<https://link.springer.com/book/10.1007%2F978-3-319-11080-6>

### Outline:

A brief provisional outline is as follows. The dates are tentative and would change based on the progress of the class. The assigned sections are from the main source (♣).

**Week 1.** Linear and Vector equations (Sections 1.1, 1.2, 1.3)

**Week 2.** Matrix equations and their solutions (Sections 1.4, 1.5)

**Week 3.** Matrices and their inverses (Sections 2.1, 2.2)

**Week 4.** Invertible matrices and determinant (Sections 2.3, 3.1)

- Week 5.** Properties and determinant (Sections 3.2,3.3)
- Week 6.** Dimension and rank (Sections 2.8, 2.9)
- Week 7.** Linear transformations (Sections 1.8, 1.9)
- Week 8.** Eigenvectors and eigenvalues (Sections 5.1, 5.2)
- Week 9.** Diagonalization (Section 5.3)
- Week 10.** Complex eigenvalues (Appendix B and Section 5.3)
- Week 11.** Inner product and orthogonality (Sections 6.1, 6.2)
- Week 12.** Orthogonal Projections (Sections 6.3)
- Week 13.** Gram-Schmidt process (Section 6.4)

### Practice:

At the end of every section, I will refer you to the some particular practice questions in the text. Although solving the questions would be voluntarily, it is very much recommended. Remember that the course examinations will be designed so that not only evaluate your knowledge but also your fluency in solving questions. A skill which will be gained only through practising a lot.

### Examinations:

- **Midterm test 1:** to be held during the TA session on June 6, %15
- **Midterm test 2:** to be held during the break. Date to be determined %20
- **Midterm test 3:** to be held during the TA session on July 25 %15
- **Final:** a regular three hour test %50

The sections which will be asked in each test will be announced in the class one week before the examination.

### Concerns/questions

My job as your teacher is to help you learn this topic and be able to use it. To do so, I need to know if you have any concerns/question regarding the course and my teaching. So, you are encouraged to contact me with any such matters. You can always write an email and come to my office during the office hours.

### Pregnancy or 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.

### 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 [pmc@carleton.ca](mailto: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 or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable).