MATH 1104E Linear Algebra for Engineering Winter 2022
(Course outline, subject to change, updated Dec., 2021)

Instructor: Dr. Jabir Abdulrahman
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Office hours: online, Tuesdays and Thursdays 9:00- 10:00 am, or by an appointment.

Textbook: Linear Algebra and its Applications (with MyLab Access Code), Sixth Edition, David C. Lay, Steven R. Lay, and Judi J. McDonald.

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 : Will be Asynchronous and will be posted on Brightspace (online audio recorded). Lectures begin on Monday Jan. 10, 2022, and end on Tuesday Apr. 12, 2022.

Tutorials: Fridays 11:35-12:25pm. There will be online problem-solving sessions during the tutorial hours. There might also be in-person tutorial sessions, depending on the number of students registered for the in-person tutorial. Tutorials start on Jan. 17, 2021.

Class conduct: Students are expected to always behave in a professional manner. Disrupting a class is an Instructional Offence (see University Calendar). Please adhere to the same standards of behaviour online that you follow in a real classroom.

Evaluation:

* 2 Mylab tests worth 5% each (10% total)
* 4 Mylab homeworks worth 2.5% each (10% total)
* 3 written assignments (posted in Brightspace) worth 15% each (45% total)
* 1 final exam (in MyLab) worth 35%

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.

Additional resources

The **Math Tutorial Centre** will be available via a link in Brightspace called "(MTC) Online Math Tutorial Centre (Winter 2022)". More details can be found here:

https://carleton.ca/math/math-tutorial-centre/

Important notes:

- Lectures will be recorded online . Lecture notes will be posted on Brightspace in advance. Students are expected to study the assigned pages of the lecture notes and the relevant sections of the textbook before each class. The classes are not a substitute for studying the lecture notes and the relevant sections of the textbook by yourself prior to each class

- More details for lectures, tutorials and office hours will be posted on Brightspace.

- 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 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, assignments, quizzes, and tests) are the intellectual property of the instructor, Jabir Abdulrahman. They are intended for personal use only and may not be reproduced or redistributed without prior written consent of the instructor.

MATH 1104E Lecture Schedule

Dates		**sections**	**Topics**
Jan.11,13		1.1,1.2	Systems of Linear Equations, Row Echelon Forms
Jan 18, 20		1.3-1.5, (1.6, 1.10 optional)	Vector Equations, The Matrix Equation **Ax = b** Solution Sets of Linear Systems
Jan 25, 27		2.1,2.2	Matrix Operations. The Inverse of a Matrix
Feb1,3	Test 1	2.3,3.1	Characterizations of Invertible Matrices. Introduction to Determinants
Feb 8, 10	Assignment 1	3.2,3.3,2.8	Properties of Determinants, Cramer's Rule, Subspaces of, R^n
Feb 15,17		1.7 2.9	Linear Independence, Dimension and Rank
Feb 22,24			WINTER BREAK(NO CLASSES)
Mar 1,3		1.8,1.9	Introduction to Linear Transformations, The Matrix of a Linear Transformation
Mar 8 , 10		5.1,5.2	Eigenvectors and Eigenvalues, The Characteristic Equation
Mar 15, 17	Assignment 2	5.3	Diagonalization
Mar 22 , 24		App. B	Complex Numbers
Mar 29 , 31	Test 2	5.5,6.1	Complex Eigenvalues,Inner Product
Apr 5, 7	Assignment 3	6.2,6.3	Length and Orthogonality. Orthogonal Sets,Orthogonal Projections.
Apr 12		6.4	Gram-Schmidt Process

Each quiz and assignment will be released on Sunday at 11pm and will be due on the following Sunday at 11pm (Ottawa time).

Policies:

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 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 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/

Teaching assistants:TBD

Section	Teaching Assistant	Email: @cmail.carleton.ca
E1		
E2		
E3		
E4		