MATHEMATICS II

IMD

Fall 2014

Instructor: Jabir Abdulrahman
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Textbook:

"Linear Algebra and its Applications" by Mohammad R. Sadeghi and Jabir M. Abulrahman.
This book is available at Haven Books where it is reasonably priced.

Prerequisites:
Ontario Grade 12 Mathematics: Geometry and Discrete Mathematics; or an OAC in Algebra and Geometry; or MATH 0107, equivalent, or permission of the School of Mathematics and Statistics.

Classes: Tuesday and Thursday 10:05-11:25. **Room:** 132 AP

Lectures begin: Thursday, September 4, 2014.

Lectures end: Monday, Dec.08, 2014.

Tutorial: Tutorials will start on Friday Sept. 19, 2014. **Room:** 132 AP

Office Hours:

- Thursday 1:30-2:30pm. If you need to make and appointment contact me.
- The Math Tutorial Centre in room 3422HP is open Monday - Thursday, 10:00 - 16:00. It is a great place to get help in 1st year math classes.
- In addition, there will be extra T.A. office hours before the tests.

Evaluation: Term mark is **50%**. The final examination is **50%**.

- **Term mark (50% of final mark):**
  - **There will be three tests**, each worth 20%, taken in tutorials on the weeks of Sep. 29, Oct. 20, and Nov. 17. Your worst test score will be dropped. These tests will amount to **40%** of your final grade.
  - **All other tutorials** will involve a group work component which will be worth **10%** of your final mark. You will work in teams of four or five students to prepare a set of answers which is handed in at the end of tutorial. This mark is not based on the correctness of your work but on the demonstration of working on the tutorial problems. Please always go to the tutorial you are registered in or risk losing your tutorial mark.

- **Exam (50% of final mark):**

  You must pass the term work in order to pass the course. If you have a passing term mark and you do better on the final exam than your term work, your final exam will count for 100% of the course. I do not accept doctor's notes for late or missed work because I cannot verify their authenticity. Students wishing to see their examination papers must make an appointment within 3 weeks of the examination. This is an opportunity to get educational feedback and **not** an opportunity to argue about the marking.

Plagiarism and Cheating

Plagiarism is defined in the undergraduate calendar as an instructional offense that occurs when a student uses or passes off "as one's own idea or product, work of another without expressly giving credit". This includes plagiarism involving material lifted from the Internet. Plagiarism is a serious offense. The penalties for students who have been found to have plagiarized are a failed grade at the least severe and suspension, expulsion or notation on transcripts for serious or repeated cases. Plagiarism is just one form of **Cheating**. All forms of cheating are taken very seriously and will be dealt with swiftly and severely.

That being said, if you are unsure whether something you are doing is actually cheating just ask the instructor.

Academic Accommodation

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

- **Pregnancy and Student Parental Leave:** 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 Parental Leave Guide
- **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 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).
- **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. For more details see the Religious Observation Guide

Withdrawal:

The last day for withdrawal from the course is **8 Dec. 2014.** Withdrawals before **30 Sep. 2014** get 100% refund, there is **NO** refund after this date.

Calculators:

Calculators are not allowed in this course.

				Tentative Schedule

WEEK	DATES	TESTS	SECTIONS	TOPICS
1	Sept.8-12		1.1-1.3,2.1	Linear Equations and Systems of Linear Equations.Echelon Forms and Elementary Row Operations. Solving Systems of Linear Equations. Matrix Operations.
2	Sept.15-19		2.2,2.3	Inverse of a Matrix and Linear systems. Elementary Matrices and(optional) LU Factorization
3	Sept.22-26		2.5,3.1	Least Squares. Introduction to Determinants.
4	Sept.29-Oct.3	**TEST 1**	3.2-3.4	Properties of Determinants. Cramer's Rule. Adjoint of a Matrix
5	Oct.6-10		4.1-4.3	Vectors in R^2 and R^3.Vectors in R^n . Vector Spaces and Subspaces.
6	Oct.13-17		4.4-4.6	Spanning sets and Linear Independence. Basis and Dimension. The Rank of a Matrix.
7	Oct.20-24	**TEST 2**	4.7, 5.1	Coordinates and Change of Basis. Introduction to Linear Transformations
8	Oct.27-31		Fall Break	No Classes
9	Nov.3-7		5.2,5.3	Linear Transformation over Vector Spaces. Matrices for Linear Transformations
10	Nov.10-14		6.1, 6.2	Introduction to Eigenvalues and Eigenvectors. Digonalization of Matrices
11	Nov.17-21	**TEST 3**	6.3 , Appendix A	Applications of Diagonalization. Complex Numbers
12	Nov.24-28	~	6.4,7.1	Complex Eigenvalues and Eigenvectors. Inner product in R^n
13	Dec. 1-8	~	7.2,7.3	Orthogonal Bases. Orthonormal Bases and Gram-Schmidt Process. Review

Suggested practice problems

Chapter 1

1.1: 1-25

1.2: 1-15

1.3: 1-17,21-25,29-32

Chapter 2

2.1: 1-13 ,15,17

2.2: 1-13 ,15-19

2.3: 1-13

2.5: 1-3

Chapter 3

3.1: 1-15

3.2: 1-13

3.3: 1-13

3.4: 1-15

Chapter 4

4.1: 1-7

4.2: 1-5

4.3: 1-9

4.4: 1-9 , 11,13-17, 19,21, 23-27

4.5: 1-17 , 19, 21

4.6: 1-11, 13-17,19,21

4.7: 1-6 ,8,9

Chapter 5

5.1:1-7,10,11,13,15

5.2: 4-7

5.3: 1-7,9-15

Chapter 6

6.1: 1-15 , 18- 21, 23-27

6.2: 1-5,7-11

6.3: 1-5

6.4: 1-6

Chapter 7

7.1: 1-21 , 25-35, 38-41

7.2: 1-7, 9-12, 14-20

7.3: 1-7