DALHOUSIE UNIVERSITY

Faculty of Science Course Syllabus
Department of Mathematics and Statistics
MATH 2030 – MATRIX THEORY AND LINEAR ALGEBRA I
2016 WINTER

Instructor: Dr. Israel Rocha
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Chase 251

Office Hours: MWF 10:30 am - 11:30 am

Lectures: MWF 9:35 am - 10:25 am, LSC-COMMON AREA C242

Prerequisites: Nova Scotia advanced Mathematics 11 or 12

Course Description

This course is a self-contained introduction to Matrix Theory and Linear Algebra. Topics include: subspaces, linear transformations, determinants, eigenvalues and eigenvectors, systems of linear equations. Students should note that this is a second-year course and, although it has no formal first-year prerequisites, certain mathematical maturity is expected.

Course Objectives/Learning Outcomes

This course provides the main elementary concepts of matrix theory and linear algebra. The student will be able to handle with: vector operations, lines and planes in n-dimensional space, systems of linear equations, matrix operations and matrix algebra, rank and determinant, eigenvalues and eigenvectors, linear independence and dependence, subspaces and spanning sets, bases and dimension. Furthermore, the student will see relevant applications of linear algebra present in the text book.

Course Materials

- Text book: Elementary Linear Algebra, 2nd Canadian Edition by Venit, Bishop, and Brown.
- Online assignments on www.webassign.net class key dal.ns 1056 3148
  You **must** purchase the book bundled with WebAssign as we will be having online assignments for which you will need access through a code purchased in the package
- On Blackboard https://dalhousie.blackboard.com/
- Class website http://mathstat.dal.ca/~rocha/math2030/

Course Assessment

- Online Assignments (WebAssign) 10%
- Midterm 1 20% (February 22)
- Midterm 2 20% (March 21)
- Final Exam 50% 2 hours – Scheduled by Registrar

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Conversion of numerical grades to Final Letter Grades follows the <u>Dalhousie Common Grade Scale</u>

A+ (90-100)	**B+** (77-79)	**C+** (65-69)	**D**	(50-54)
A (85-89)	**B** (73-76)	**C** (60-64)	**F**	(<50)
A- (80-84)	**B-** (70-72)	**C-** (55-59)		

Course Policies

- Students can get help with this course in the Student Resource Centre which is located in Room 119 on the 1st floor of the Chase Building. A tutor will be available on weekdays and evenings on a first come, first served basis, free of charge. Also, there are large tables where you can work together. To see the current schedule, please visit the Resource Centre's webpage http://www.dal.ca/faculty/science/math-stats/about/learning-centre.html.
- Missed exams can be made up for documented illness or upon receipt of equivalent proof of inability.
- If you miss a midterm without authorization then it will count as 0 and the weight of the missed midterm will be shifted to the final exam (e.g., the final exam will then count 70% instead of 50%).
- Calculators will NOT be allowed during the midterm or the final examination. Only writing utensils (pencils, lead, erasers, pens, white-out) will be allowed.

Course Content

Jan 4	Introduction
Jan 6-8	1.1: Vectors in R2 and R3
	1.2: Dot and Cross Products
Jan 11-15	1.2: Dot and Cross Products
	1.3: Lines and Planes
Jan 18-22	2.1: Euclidean m-Space
	2.2: Systems of Linear Equations
Jan 25-29	2.3: Row Reduction of Linear Systems
	3.1: Operations on Matrices
Feb 1-3	3.2: Matrix Equations and Inverses
	3.3: Theory of Linear Systems
Feb 5	Munro Day - University closed
Feb 8	Last day to drop winter term courses without a "W"
Feb 8-12	3.5: Elementary Matrices and Linear Systems
Feb 15-19	Study Break
Feb 22	Midterm 1
Feb 24-26	4.1: Definition of a Determinant
	4.2: Properties of Determinants
Feb 29-Mar 4	4.3: Cramer's Rule
	4.4: An Introduction to Eigenvalues
Mar 7-11	5.1: Linear Independence and Dependence
	5.2: Subspaces of Rm
Mar 11	Last day to drop winter term classes with a "W"
Mar 14-18	5.3: Basis and Dimension
	5.4: Rank of a Matrix
Mar 21	Midterm 2

Mar 23	Applications of linear algebra
Mar 25	Good Friday - University closed
Mar 28-Apr 1	Applications of linear algebra
Apr 4	Review
April 6	Review
Scheduled by Registrar	Final Exam

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ACCOMMODATION POLICY FOR STUDENTS

Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic protected under Canadian Human Rights legislation. The full text of Dalhousie's Student Accommodation Policy can be accessed here:

http://www.dal.ca/dept/university_secretariat/policies/academic/student-accommodation-policy-wef-sep--1--2014.html

Students who require accommodation for classroom participation or the writing of tests and exams should make their request to the **Advising and Access Services Centre (AASC)** prior to or at the outset of the regular academic year. More information and the **Request for Accommodation** form are available at www.dal.ca/access.

ACADEMIC INTEGRITY

Academic integrity, with its embodied values, is seen as a foundation of Dalhousie University. It is the responsibility of all students to be familiar with behaviours and practices associated with academic integrity. Instructors are required to forward any suspected cases of plagiarism or other forms of academic cheating to the Academic Integrity Officer for their Faculty.

The Academic Integrity website (http://academicintegrity.dal.ca) provides students and faculty with information on plagiarism and other forms of academic dishonesty, and has resources to help students succeed honestly. The full text of Dalhousie's **Policy on Intellectual Honesty** and **Faculty Discipline Procedures** is available here:

http://www.dal.ca/dept/university_secretariat/academic-integrity/academic-policies.html

STUDENT CODE OF CONDUCT

Dalhousie University has a student code of conduct, and it is expected that students will adhere to the code during their participation in lectures and other activities associated with this course. In general:

"The University treats students as adults free to organize their own personal lives, behaviour and associations subject only to the law, and to University regulations that are necessary to protect

- the integrity and proper functioning of the academic and non – academic programs and activities of the University or its faculties, schools or departments;
- the peaceful and safe enjoyment of University facilities by other members of the University and the public;

- the freedom of members of the University to participate reasonably in the programs of the University and in activities on the University's premises;
- the property of the University or its members."

The full text of the code can be found here:
http://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

COPYRIGHT
All members of the Dalhousie community are expected to comply with their obligations under Canadian copyright law. Dalhousie copyright policies and guidelines, including our Fair Dealing Guidelines, are available at http://www.dal.ca/dept/copyrightoffice.html. Copyright questions should be directed to the Copyright Office at copyright.office@dal.ca.

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SERVICES AVAILABLE TO STUDENTS

The following campus services are available to help students develop skills in library research, scientific writing, and effective study habits. The services are available to all Dalhousie students and, unless noted otherwise, are <u>free</u>.

Service	Support Provided	Location	Contact
General Academic Advising	Help with - understanding degree requirements and academic regulations - choosing your major - achieving your educational or career goals - dealing with academic or other difficulties	**Killam Library Ground floor** Rm G28 ***Bissett Centre for Academic Success***	In person: Killam Library Rm G28 By appointment: - e-mail: advising@dal.ca - Phone: (902) 494-3077 - Book online through MyDal
Dalhousie Libraries	Help to find books and articles for assignments Help with citing sources in the text of your paper and preparation of bibliography	**Killam Library Ground floor** Librarian offices	In person: Service Point (Ground floor) By appointment: Identify your subject librarian (URL below) and contact by email or phone to arrange a time: http://dal.beta.libguides.com/sb.php?subject_id=34328
Studying for Success (SFS)	Help to develop essential study skills through small group workshops or one-on-one coaching sessions Match to a tutor for help in course-specific content (for a reasonable fee)	**Killam Library 3rd floor** Coordinator Rm 3104 Study Coaches Rm 3103	To make an appointment: - Visit main office (Killam Library main floor, Rm G28) - Call (902) 494-3077 - email Coordinator at: sfs@dal.ca or - Simply drop in to see us during posted office hours **All information can be found on our website: www.dal.ca/sfs**
Writing Centre	Meet with coach/tutor to discuss writing assignments (e.g., lab report, research paper, thesis, poster) - Learn to integrate source material into your own work appropriately - Learn about disciplinary writing from a peer or staff member in your field	**Killam Library Ground floor** Learning Commons & Rm G25	To make an appointment: - Visit the Centre (Rm G25) and book an appointment - Call (902) 494-1963 - email writingcentre@dal.ca - Book online through MyDal We are open six days a week **See our website: writingcentre.dal.ca**