MATH 235   LINEAR ALGEBRA 2   FALL 2018

Course Objectives:

• To improve your ability to communicate mathematics including writing mathematical proofs;

• To improve your overall understanding of mathematics and mathematical thinking;

• To develop your understanding of several important concepts, methods, and techniques in linear algebra;

• To improve your ability to use definitions, theorems, methods, and techniques from memory to construct solutions to problems and/or proofs.

Course Schedule

Week	Dates	Text Sections	Topics
1	Sept 7	7.1	Fundamental Subspaces
2	Sept 10 - 14	7.1, 8.1	Bases of Fundamental Subspaces, General Linear Mappings
3	Sept 17 - 21	8.2, 8.3	Rank-Nullity Theorem, Matrix of a Linear Mapping
4	Sept 24 - 28	8.3, 9.1	Matrix of a Linear Mapping, Inner Product Spaces, Length
5	Oct 1 - 5	9.2, 9.3, 9.4	Orthogonality, Gram-Schmidt Procedure, Orthogonal Complements
6	Oct 12	9.4	Projections
7	Oct 15 - 19	9.5, 9.6	Fundamental Theorem, Method of Least Squares
8	Oct 22 - 26	10.1, 10.2	Triangularization, Orthogonal Diagonalization
9	Oct 29 - Nov 2	10.3, 10.4	Quadratic Forms, Graphing Quadratic Forms
10	Nov 5 - 9	10.4, 10.5, 10.6	Graphing and Optimizing Quadratic Forms, Singular Values
11	Nov 12 - 16	10.6, 11.1, 11.2	Singular Value Decomposition, Complex Vector Spaces
12	Nov 19 - 23	11.3, 11.4	Complex Diagonalization, Hermitian Inner Products
13	Nov 26 - 30	11.5	Unitary Diagonalization, Normal Matrices
14	Dec 3	11.6	Cayley-Hamilton Theorem

Text Book: Linear Algebra Course Notes Edition 4.0 by Dan Wolczuk. Available in the bookstore.

Grades: Final Exam: 60%; Midterm: 28%; Quizzes: 12%

Midterm: Tuesday, October 30th, 4:30 - 6:20 pm
Final Exam : TBA

NOTE: Missed tests will count as 0 unless suitable documentation is provided.
There will not be any make-up quizzes, nor a make-up midterm. The weight of a missed midterm (with documentation) will be transferred to the final exam.
If you are unable to write the final exam, to be granted a grade of INC (a deferred final exam), you must provide suitable documentation for the absence, you must have written the midterm, and you must have a combined score of at least 22/40 on the midterm/quiz portion of the course.

Tutorials: The quizzes will be held during the first 40 minutes of each tutorial except for Oct 29th which will be used for Midterm prep and Dec 3rd which will be used for Final Exam prep. There is no tutorial Sept 10th.

Quizzes: The topics covered in each of the 40 minute quizzes is indicated in posted on Learn. To prepare for the quizzes it is highly recommended that you solve the practice problems that are posted on Learn as well as additional problems from the course notes. Your quiz grade will be computed from your best 6 quizzes.

Calculators: Calculators will not be allowed on tests or quizzes.

Additional Help: We will be using Piazza (piazza.com) as a discussion forum. It is highly encouraged that you participate in the discussions. Additionally, your instructor will let you know when they are available to answer questions.

List of Instructors:

Section	Time	Room	Instructor	Office
001	8:30 - 9:20 MWF	MC 4020	S. Crawford	MC 5329
002	10:30 - 11:20 MWF	STC 0050	M. Akash	MC 6508
003	10:30 - 11:20 MWF	MC 4021	D. Wolczuk	MC 6413
004	11:30 - 12:20 MWF	QNC 2502	H. Wolkowicz	MC 6312
005	3:30 - 4:20 MWF	B1 271	D. Wolczuk	MC 6413

Academic Integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility.

[Check www.uwaterloo.ca/academicintegrity/ for more information.]

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4:
http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm.
When in doubt please be certain to contact the department's administrative assistant who will provide further assistance.

Discipline: A student is expected to know what constitutes academic integrity to avoid committing academic offenses and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, academic adviser, or the undergraduate associate dean. For information on categories of offenses and types of penalties, students should refer to Policy 71, Student Discipline,
http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm.
For typical penalties check Guidelines for the Assessment of Penalties,
http://www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm.

Appeals: A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72, Student Appeals,
http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm.

Note for students with disabilities: AccessAbility Services, located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility services at the beginning of each academic term.