

MATH 2300: Linear Algebra II

Winter 2010

Course Information

Lectures: Tues/Thurs 10:00-11:15am, 205 Armes. Last class: Thurs Apr 8, 2010.

** VW Date: March 19 **

Calendar description: A continuation of MATH 1300 or MATH 1310. Finite dimensional vector spaces; linear transformation and matrices; eigenvalues and eigenvectors; diagonalization and applications; inner product spaces.

Instructor Information

Mr. Robert Borgersen

Office Location: 425 Machray Hall (Ph: 474-9791)

Email: borgersen2008@gmail.com

Office Hours: Office hours are times I am guaranteed to be available in my office, but I am in my office most of the time working anyway, and if you would like to come by, my door is always open.

My office hours are:

Mondays 12:30-1:30pm

Wednesdays 10:30-11:30am

Thursdays 8:30-10:00am

Website

The website for this course is maintained at <http://www.robertborgersen.info/Math2300>. Students are expected to check the website regularly for course announcements.

Grading & Evaluation

There will be 5 assignments, 2 term tests, and 1 final exam. Students should see the website for more details regarding the assignments and tests. The breakdown of the grade is:

Assignment 1.....3%

Assignment 2.....3%

Assignment 3.....3%

Assignment 4.....3%

Assignment 5.....3%

Test 1.....15%

Test 2.....15%

Final Exam.....55%

Required Text

An Introduction to Linear Algebra with Applications by Roman, 2nd edition

We will cover chapters 5, 6, 7, and 8 of this book. In terms of prerequisites for this course, you should know the content in Chapters 1-4 quite well. You also should have seen a good amount of Chapter 5 already. If this does not describe you, you should come talk to me as soon as possible. **Note that for those who took MATH 1310, you may have missed out on most of Chapters 4 and 5—this may cause you a great deal of extra difficulty in this course.**

Other Texts

Linear Algebra by Anton, 9th edition

This book is useful mainly because if you took Math 1300 recently, you may have it as it was the text book for that course. I would strongly recommend using this text as a supplement to the main text book. To this end, the book is on reserve in the science library for you. Use it if you (a) would like more questions to do, or (b) would like to read the content presented in a different way. We will cover chapters 5, 6, 7, and 8, though not in that order. The “Applications Version” is also acceptable.

Course Schedule

<u>Week #</u>	<u>Dates</u>	<u>Topics</u>	<u>Chapters/Sections</u>
1	January 7	Intro, start review of matrices	2.1-2.5, 3.1-3.4
2	January 11 – 15	Finish review of matrices, review of systems and review of Vectors, start Vector Spaces	1.1-1.3, 3.5, 4.1-4.7, 5.1
3	January 18 – 22	Vectors Spaces, Subspaces, Linear Combinations and Span	5.1-5.3
4	January 25 – 29	Linear independence / dependence, Basis, Dimension	5.4-5.6
5	February 1 – 5	Row Space, Column Space, Test 1	5.7
6	February 8 – 12	Linear Transformations, Kernel, Rank, Nullity	6.1-6.5
7	February 15 – 19	SPRING BREAK	
8	February 22 – 26	1:1, Onto, Isomorphism, Inverses	6.6-6.7
9	March 1 – 5	Geometric transformations, start Eigenvalues	6.7, 7.1-7.2
10	March 8 – 12	Test 2, More complicated Eigenvalues/vectors	7.2
11	March 15 – 19	Diagonalization, Powers of a matrix	7.3
12	March 22 – 26	Inner product spaces, Cauchy Schwarz, projections	8.1-8.2
13	March 29 – April 2	Orthonormal, Gram-Schmidt, Least Squares (time permitting)	8.2-8.4
14	April 5 – April 9	Grace/Review	

Calculators and Other Aides

Calculators are not allowed in this course whatsoever, nor are they necessary. All tests are closed book.

Cheating and Academic Dishonesty

Students are advised to familiarize themselves with the University policy concerning “plagiarism and cheating” and “examinations – impersonations” appearing in the General Calendar.

The Department of Mathematics, the Faculty of Science and the University of Manitoba regard acts of academic dishonesty in quizzes, tests, examinations or assignments as serious offenses and may assess a variety of penalties depending on the nature of the offense. Acts of academic dishonesty include bringing unauthorized materials into a test or exam, copying from another student, plagiarism and examination personation. Students are advised to read section 7 (Academic Integrity) and section 4.2.8 (Examinations: Personations) in the "General Academic Regulations and Requirements" of the current Undergraduate Calendar. Note, in particular that cell phones and pagers are explicitly listed as unauthorized materials, and hence may not be present during tests or examinations.

Penalties for violation include being assigned a grade of zero on a test or assignment, being assigned a

grade of "F" in a course, compulsory withdrawal from a course or program, suspension from a course/program/faculty or even expulsion from the University. For specific details about the nature of penalties that may be assessed upon conviction of an act of academic dishonesty, students are referred to University Policy 1202 (Student Discipline Bylaw) and to the Department of Mathematics policy concerning minimum penalties for acts of academic dishonesty.

The Student Discipline Bylaw is printed in its entirety in the Student Guide, and is also available online or through the Office of the University Secretary. Minimum penalties assessed by the Department of Mathematics for acts of academic dishonesty are available on the Department of Mathematics webpage.

All Faculty members (and their teaching assistants) have been instructed to be vigilant and report incidents of academic dishonesty to the Head of the Department.