

MATH 221, FIRST SUMMER TERM, 2014

1. CONTACT INFORMATION

The instructor for this course is me, Ben Williams. I may be reached at `tbjw@math.ubc.ca`. I try to reply to all student email within 24 hours.

My office hours will be announced later.

2. MEETING TIMES

The course meets at the following times:

- Monday 1pm–3pm
- Wednesday 1pm–2pm
- Thursday 1pm–3pm
- Friday 1pm–3pm

All lectures take place in Buchanan A102.

There is no class on Monday 19 May, Victoria Day.

3. TEXTBOOK

The textbook for this course is *Linear algebra and its applications* by David Lay. The third edition (customised for UBC) is the version I have, and is in the bookstore, but any version of the textbook will be ok.

4. HOMEWORK

Homework will be assigned once or twice per week on the UBC Connect system. The first homework will be online on the first day of teaching, and will be due Friday 16th May, at the start of class.

Your lowest-scoring homework will not be included in the grade calculation. Otherwise, no extensions will be given, and no student will be excused from doing homework for any reason.

5. MIDTERM EXAMS

There will be a midterm exam, probably during class time on Wednesday the 4th June, although I reserve the right to change the time of the exam.

6. OVERALL COURSE GRADE

The overall course grade will be made up from 10% homework, 30% midterm and 60% final exam.

No extensions will be given for homework under any circumstances. Students who are unable to take the midterm exam should contact me beforehand in order to make alternate arrangements.

Students who suffer serious injury or illness or bereavement during the course should contact me as well.

7. LIST OF TOPICS

The following is a list of topics that will be followed, and in the order given. The chapter of the textbook is also given:

Week 1

- The language of sets (not in textbook)
- 1.1 Systems of linear equations,
- 1.2 Row reduction & echelon form,
- 1.3 Vector forms of linear equations,
- 1.4 Matrix forms of linear equations,

Week 2

- 1.5 Solution sets of linear equations,
- 1.7 Linear independence,
- 1.8 Introduction to linear transformations,
- 1.9 The matrix of a linear transformation.

Week 3

- 2.1 Matrix operations,
- 2.2 The inverse of a matrix,
- 2.3 Characterisations of invertible matrices,
- 2.5 Subspaces of \mathbf{R}^n ,

Week 4

- 2.6 Dimension and rank.
- 3.1 Introduction to determinants,
- 3.2 Properties of determinants.
- 4.1 Eigenvalues and Eigenvectors,

Week 5

- 4.2 The characteristic equation,
- 4.3 Diagonalization,
- 4.6 Discrete dynamical systems.

Week 6

- 5.1 Inner product, length and orthogonality,
- 5.2 Orthogonal sets,
- 5.3 Orthogonal projection,
- 5.5 Least squares problems,
- 5.6 Applications to linear models.