

Math 221: Matrix Algebra Summer 2015

Course Web Page: <http://www.math.ubc.ca/~vatsal/>

- Instructor: Nike Vatsal, vatsal@math.ubc.ca
- Section 921: Monday, Thursday, Friday: 1-3pm, Wednesday 1-2pm
- Location: Buchanan A102, except for exam days. Exam locations TBA
- Office hours: Wednesday 2-3.30, in Math 222c. Additional office hours will be held on the day before the term exams.

Textbook: *Linear algebra and its applications*, by David Lay (Third Edition, as customized for UBC). Please note that the Third UBC Edition of the book is the only officially supported version; there are many other editions also available which you can try to use. However, your instructors cannot be held responsible for any changes in page numbering or changed material.

List of topics covered

- §1.1 Systems of linear equations
- §1.2 Row reduction and echelon forms
- §1.3 Vector equations
- §1.4 The matrix equation $Ax = b$
- §1.5 Solution sets of linear equations
- §1.6 Applications of linear systems
- §1.7 Linear independence
- §1.8 Introduction to linear transformations
- §1.9 The matrix of a linear transformation
- §2.1 Matrix operations
- §2.2 The inverse of a matrix
- §2.3 Characterizations of invertible matrices
- §2.5 Subspaces of \mathbb{R}^n
- §2.6 Dimension and rank
- §3.1 Introduction to determinants

§3.2 Properties of determinants
§4.1 Eigenvalues and eigenvectors
§4.2 The characteristic equation
§4.3 Diagonalization
§4.6 Discrete dynamical systems
§5.1 Inner product, length, and orthogonality
§5.2 Orthogonal sets
§5.3 Orthogonal projection
§5.5 Least-squares problem
§5.6 Applications to linear models

Homework and TAs: There are no TAs for this course and no collected homework. Suggested problems are posted on the course website. There will be time set aside in class for discussion of the problems, and weekly office hours as well. It is recommended that you do as many practice problems as possible.

Evaluation: The course mark will be computed in one of two ways, with the higher one being taken:

Final exam: 55%
Term exams: 3 x 15% each.

or

Final exam 70%
Best 2/3 midterm scores: 2 x 15%.

The grade of those students who miss a midterm exam will be computed by the second method. There will be **no makeup exams given under any circumstances**. You are required to write 2/3 term exams in order to pass the course.

The following applies to all exams in Math 221: No aids of any kind: no calculators, no notes, no books. No cell phones or other electronic devices of any kind.