

## MATH 221 921 – Matrix Algebra

Session: 2019 Summer Term 1 (May-June)

Time/Place:

Mon 13:00-15:00 IBLC 182

Wed 13:00-14:00 IBLC 182

Thu 13:00-15:00 IBLC 182

Fri 13:00-15:00 IBLC 182

Instructor: Dr. Jishnu Ray

Office hours: Monday, Thursday and Friday, 15:00 -16:00, Room: LSK 300 B

Textbook: Linear algebra and its applications, by David Lay (**Third Custom Edition for UBC**).

Exams: There will be 1 midterm exam, and one final exam.

Midterm: 27 May in class (tentative)

Final Exam : Tentative: last week of June (exact date to be announced)

The following applies to all exams in Math 221: No aids of any kind: no calculators, no notes, not books. No electronic devices of any kind.

If you miss the midterm exam for medical reasons, you need to promptly inform the instructor, and provide a physician's note specifically stating that you were medically unfit to write the missed exam on that day. No make-up exams will be given. Your grade will be based on the other course components.

Homeworks: There will be 2 (long) homework assignments.

Homework 1 and 2 are designed to prepare you for the midterm 1 and the final respectively.

You are encouraged to work in groups on homework assignments, although independent effort is also crucial to learning. Directly copying someone else's homework will be treated as a violation of UBC's Academic Integrity Code. See UBC's policy on plagiarism for details.

Marking: Your final grade will be based on homeworks, the midterm and the final exam:

Homework 1	10%
Homework 2	10%
Midterm 1	30%
Final Exam	50%

Syllabus: These section numbers matches with only the third custom edition of the textbook.

Syllabus:

- 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
- 5.4 The Gram-Schmidt process