Vv214 Linear Algebra

1 Introduction

1.1 Course Profile

1.1.1 Contact Information

- Instructor:

    Jing Liu

- Lectures:

Monday	(8:00am − 9:40am)	in E1-200
Wednesday	(8:00am − 9:40am)	in E1-200
Thursday	(6:20pm − 8:00pm)	in E1-200 Week 5–10 Only

- Office Hours:

Monday	(10:10am − 3:30pm)	in JI-Building 204
Thursday	(08:00am − 9:30am)	in JI-Building 204

- Email:

    stephen.liu@sjtu.edu.cn

- Teaching Assistant/s:

    See Canvas for his/her contact information

1.1.2 Grading Policy

- Assignment:

    30% Assignments will be given in the form of problem sets, and may require extra reading and the use of Matlab.
    Bonus can be and only be credited to and between assignments, and it cannot be used to exceed the full grade.
    Assignments need to be submitted to the correct pigeonhole in the JI-building before the beginning of class on the day indicated on the assignment. Please plan your time accordingly, late assignment will be severely penalised.

- Exam:

70%	There will be three exams:	Midterm I	Midterm II	Final
		20%	25%	25 %

- For this course, the grade will be curved to achieve a median grade of "B".

1.1.3   Textbook and Syllabus

- Otto BRETSCHER, Linear Algebra with Applications (5th edition)
- Some Additional Material:
    - David LAY, Linear Algebra and its Applications (3rd edition)
    - Gilbert STRANG, Introduction to Linear Algebra (4th edition)
    - Jim HEFFERON, Linear Algebra (3rd edition)
- More Advanced Material:
    - Stephen FRIEDBERG, Linear Algebra (4th edition)
    - Sheldon AXLER, Linear Algebra Done Right (2nd edition)
    - Kenneth HOFFMAN and Ray KUNZE, Linear Algebra (2nd edition)

Week	Topics
1	Systems of Linear Equations Gaussian Elimination
2	Matrix Multiplication Invertible Matrices
3	Diagonal, Triangular, Symmetric and Block Matrices Determinant
4	Applications: Curve Fitting Vector Spaces
5	**First Midterm Exam** Subspaces and Spanning sets Linear Independence
6	Fundamental Subspaces Basis and Dimension Rank and Nullity
7	Isomorphism Homomorphism Change of Basis
8	Applications: Election and Cryptography More Spaces **Second Midterm Exam**
9	Orthogonality Orthogonalization Applications: Least Squares
10	Eigenvalues and eigenvectors Similarity Applications: Page Ranking
11	Complex Scalars Hermitian, Unitary, and Normal Matrices
12	Single Value Decomposition Positive Definite Matrices
	Final Exam

1.1.4 Matlab

- Students are strongly encouraged to get acquainted with a computer algebra system and use it to experiment with the topics discussed in the class. Free software for both symbolic and numerical calculations (e.g. Maxima, Octave) are available, along with commercial tools such as Matlab .

- What is Matlab?

  It is a software used by millions of engineers and scientists.

- What does it do?

  It is designed to help you solve equations and manipulate expressions with minimal programming. It is particularly good at doing matrix operations.

- How to get Matlab

  Matlab is installed on all computers in the JI Computer Lab.

  You can also install Matlab on your own computer.

  1. Register your name at MathWorks using your sjtu email

  2. Download

  3. Activate

  Detailed instructions can be found at JI's IT-page .

1.1.5 Honour Code

- Honesty and trust are important. Students are responsible for familiarising themselves with what is considered as a violation of honour code.

- Assignments/projects are to be solved by each student individually. You are encouraged to discuss problems with other students, but you are advised not to show your written work to others. Copying someone else's work is a very serious violation of the honour code.

- Students may read resources on the Internet, such as articles on Wikipedia, Wolfram MathWorld or any other forums, but you are not allowed to post the original assignment question online and ask for answers. It is regarded as a violation of the honour code.

- Since it is impossible to list all conceivable instance of honour code violations, the students has the responsibility to always act in a professional manner and to seek clarification from appropriate sources if their or another student's conduct is suspected to be in conflict with the intended spirit of the honour code.