



Algebra and Geometry

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Grading policy

- Homework and class participation. **20%**

One homework after one section

Several assignments will be collected at a time. The submission date will be informed one week in advance.

At the **beginning of class on the due date**, submit your assignments **in A4 size papers, with your name and student ID.**

Staple them together before submission.

- Due to the university policy, we will check attendance randomly.

*Students who miss more than one-third of the class
will be not allowed to take the final exam.*

- Midterm Exam. **30%** **Closed-book Exam**
- Final Exam. **50%**



Textbook

No required textbook.

➤ Optional reference:

Gilbert Strang, *Introduction to Linear Algebra*, fifth edition.



Syllabus

1. Introduction to vectors

- 1.1 Vectors and linear combinations
- 1.2 Lengths and dot products
- 1.3 Matrices

2. Solving linear equations

- 2.1 Vectors and linear combinations
- 2.2 The idea of elimination
- 2.3 Elimination using matrices
- 2.4 Rules for matrix operations
- 2.5 Inverse matrices
- 2.6 Factorization: $A = LU$
- 2.7 Transposes and permutations

3. Determinants

- 3.1 The properties of determinants
- 3.2 Permutations and cofactors
- 3.3 Cramer's rule, inverses and volumes

4. Vector spaces and subspaces

- 4.1 Spaces of vectors
- 4.2 The nullspace of A
- 4.3 The complete solutions to $Ax=b$
- 4.4 Independence, basis and dimension

5. Eigenvalues and eigenvectors

- 5.1 Introduction to eigenvalues

➤ Optional reference:

Gilbert Strang, *Introduction to Linear Algebra*, **fifth edition**.

Chapter 1, 1.1-1.3, **Chapter 2**, 2.1-2.7, **Chapter 5**, 5.1-5.3, **Chapter 3**, 3.1-3.4, **Chapter 6**, 6.1.

Gilbert Strang's lecture videos on MIT OpenCourseWare



Teaching Assistants

If there is any problem, you can contact your TA.

TA	Email	Responsible majors
Zipo Jibao 吉保子坡	2644772143@qq.com	Mechanical Engineering Class 1 Computer Science Class 4 Civil Engineering Class 2
Jian Wen 温建	1756781400@qq.com	Mechanical Engineering Class 2 Robot Engineering Class 3
Lin Zhang 张林	2405703848@qq.com	Robot Engineering Class 1 Architecture Class 1
Zijuan Xin 辛子娟	2316016702@qq.com	Robot Engineering Class 2 Computer Science Class 1
Zhihuang Ning 宁智煌	1721465540@qq.com	Architecture Class 2 Computer Science Class 5
Zhi-ang Yuan 袁稚昂	350320449@qq.com	Computer Science Class 2 Computer Science Class 3
Chentao Gong 龚晨涛	1004413406@qq.com	Electrical Engineering Class 1 and 2 Civil Engineering Class 1