

MATH 0280: Matrices and Linear Algebra 05

FALL, 2024

COURSE DESCRIPTION

This course delves into the foundational elements of linear algebra, covering essential topics such as vectors, matrices, determinants, linear transformations, eigenvalues, and eigenvectors. Students will explore both the theoretical aspects and practical applications of these concepts, which are pivotal in various scientific and engineering fields.

INSTRUCTOR

Hao Qin, Room 527

Email: hao.qin@scupi.cn

Office Hours: Monday 2-6 pm, Tuesday 9-12 am, or by appointment

TEACHING ASSISTANT

Leo Huo, email: 2022141520052@stu.scu.edu.cn

Haoyu Ning, email: 2021141520120@stu.scu.edu.cn

LECTURES

Monday 8:15-11:00 am, Teaching Building1 A 612. In-person attendance is required for all class meetings.

RECITATION

Monday and Wednesday 4:45-5:45 pm, location TBA

TEXTBOOK

David Poole: Linear Algebra, A Modern Introduction, 4th ed.

COURSE OBJECTS AND LEARNING OUTCOMES

In this course, you will be expected to:

- Perform matrix and vector operations
- Find the inverse of a matrix
- Calculate the eigenvalues and eigenvectors of matrices with real coefficients
- Identify a basis for the row space, column space, and null space of a matrix
- Determine whether a set of vectors is linearly independent
- Find the orthogonal complement of a subspace in a finite-dimensional vector space
- Perform singular value decomposition of a matrix

COURSE REQUIREMENTS AND GRADING

There will be homework assignments, quizzes, a designed project, and two exams.

- Homework: 20%
- Quizzes: 10%
- Design Project: 20%
- Midterm Exam: 20%
- Final Exam: 30%

HOMEWORK

Homework assignments and their due dates will be given in the lectures. All work should be clearly presented, showing all steps to demonstrate your understanding of the process. While collaboration with classmates is encouraged, the final submission must be your own independent work, and plagiarism is strictly prohibited. **No late homework** will be accepted.

QUIZZES

There will be short quizzes given during the class meetings. Quizzes are designed to test basic skills and prepare you for the exams.

DESIGN PROJECT

You will generally work in groups of 4 or 5 on a project that requires an oral presentation (15 to 20 minutes, followed by a 5-minute Q&A) accompanied by a PowerPoint slide show. The project should focus on various applications of linear algebra, and you are strongly encouraged to choose a topic that connects with your major or area of study. For inspiration, refer to the "APPLICATIONS" section on the first cover page of your textbook. Detailed project instructions will be provided later.

EXAMS

There is a midterm exam and a final exam. Each test will focus on the material presented since the previous exam, while also having the potential to include content from earlier sections. Attendance at all exams is mandatory. Make-up exams will only be given in the event of an emergency and only if advance notification is provided.

ACADEMIC INTEGRITY

Maintaining academic integrity is essential in this course. All work submitted must be your own, whether individual or group assignments. Plagiarism, cheating, or any form of dishonesty will not be tolerated and will result in disciplinary action as per the institution's policies. You are encouraged to collaborate with classmates on understanding concepts, but all submitted work must reflect your independent effort. Properly cite any sources or assistance received and uphold the highest standards of academic honesty in all your work.

TENTATIVE PROGRESS

Week	Topic Sections	Notes
1	2.1 – 2.2	
2	2.3	
3	Review Ch.2 3.1 – 3.2	
4	3.2 – 3.3	
5	3.4 – 3.5	
6	3.5	
7	3.6 Review Ch.3	
8	4.2	
9	4.1-4.3	
10	4.3-4.4	

11	4.4 Review Ch.4	Midterm Exam
12	5.1 – 5.2	
13	5.2	
14	5.1 - 5.2	
15	5.3	
16	5.4	
17	5.5, Presentations	
18	Presentations	
		Final Exam