Math0280: Matrices and Linear Algebra – Section 1
Spring Semester, 2024

INSTRUCTOR: Zheng Yang; **OFFICE:** Room 3-324B; **EMAIL:** zhengyang2018@scu.edu.cn

OFFICE HOURS: Monday and Wednesday 2 pm – 6 pm, Weekends by appointments
LECTURES: Thursday 8:15 am – 9 am, 9:10 am – 9:55 am, 10:15 am – 11 am, Room 3-102

TA: Fangyi Zhang, email: 2021141520131@stu.scu.edu.cn

TA QQ group: Please scan the *QQ Group QR code* posted on Blackboard under Content.
TA recitation hours: TBA

TEXTBOOK: *David Poole: Linear Algebra, A Modern Introduction, 4th ed.*
DESCRIPTION: The principal topics of the course include vectors, matrices, determinants, linear transformations, eigenvalues and eigenvectors, and selected applications. We will cover most of **Chapters 1, 2, 3, 4, 5, and 7**. The essential concepts/ideas in Chapter 6 will also be discussed repeatedly, even though the Chapter will not be officially lectured.

PREREQUISITE: Math220 Analytic Geometry and Calculus 1, Math 230 Analytic Geometry and Calculus 2

Course Objectives: In this course, you will be expected to:
- Explore and learn the core concepts associated with the main topics.
- Develop effective written and oral communication skills.
- Begin to think abstractly about certain key notions.
- Understand how these ideas can be used to solve problems and compute things.

Course Student Learning Outcomes: The course is designed to provide a foundation in both computational and theoretical linear algebra. At the conclusion of the course, the student will be able to, for example:
- Perform matrix and vector operations.
- Find an inverse of a matrix.
- Find the eigenvalues and eigenvectors of matrices with real coefficients.
- Find a basis for row space, column space and null space for a given matrix.
- Determine if a set of vectors is linearly independent or not.
- Find the orthogonal complement of a subspace in a finite dimensional vector space.
- Find a singular value decomposition of a given matrix.

GRADE: The final grade will be based on the **score** which is a number between 0 and 100 determined by

Homework: 20%   Quiz: 10%   Project: 20%
Midterm Exams: 30%   Final Exam: 20%

A: 90 – 100	A−: 85 – 90	B+: 80 – 84	B: 76 – 80	B−: 73 – 76	
C+: 70 – 73	C: 66 – 70	C−: 63 – 66	D+: 61 – 62	D: 60	F: < 60

ASSIGNMENTS: Homework assignments and their due dates will be given in the lectures. Homework must be **written in a neat form**. Please follow the *homework submission requirement* posted on Blackboard. **NO LATE homework** (no matter what excuses you may have) will be accepted. Using computer software (such as MATLAB) to do some homework is fine, but you should always explain your understanding in explicit details. **Please talk with me/TAs if you are not clear about anything.**

QUIZ: There will be short quizzes given during the recitations. I will drop your lowest quiz score.

PROJECTS: Generally, you will work as a group of 4 or 5, and the project will require an oral presentation (15 to 20 minutes, with 5 minutes for Q&A) with PPT slides show. The project should focus on many applications of linear algebra. You are strongly encouraged to find one connected with your current major studies. For a possible list of applications, you may look at the first cover page APPLICATIONS of your textbook. Please refer to the *project instructions* (post later) for more details. See below for the due dates of the project.

EXAMS: There are two midterm exams and a final exam. Each test will emphasize material since the previous exam, but may include anything covered previously. The final exam will be comprehensive. There is **NO Make up for all the exams**.

ATTENDANCE: You are expected to attend all the classes. I will check the attendance but will not be used toward your grade. A student who misses a class is responsible for finding out what was covered in the class.

ACADEMIC MISCONDUCT:
All students in attendance at the Sichuan University are expected to be honorable and to observe standards of conduct appropriate to a community of scholars. The University expects from its students a higher standard of conduct than the minimum required to avoid discipline. Academic misconduct includes all acts of dishonesty in any academically related matter and any knowing or intentional help or attempt to help, or conspiracy to help, another student. These include, but are not limited to, cheating, plagiarism, fabrication of information, misrepresentation, and abetting any of the above. The Academic Misconduct Disciplinary Policy will be followed in the event that academic misconduct occurs. Students should refer to the Student Handbook.

NON-ACADEMIC MISCONDUCT: All cell phones and other electronic devices are to be turned off and out of sight while you are in the classroom. All newspapers and other materials not related to the class are to be put away once class begins. Operating these devices and reading unrelated materials while in class is disrespectful of your instructor and fellow classmates. If you fail to abide by this rule, the instructor has the right to confiscate the device or materials. If you have an emergency and need to have your phone turned on during class, ask your instructor for permission.

Tentative Progress (*used in Fall 2022)		
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	**Midterm Exam**
8	4.2	
9	4.1 – 4.3	
10	4.3 - 4.4	
11	4.4, Review Ch.4	
12	5.1 – 5.2	
13	5.2	**Midterm Exam**
14	5.1 - 5.2	
15	5.3	
16	5.4	
17	5.5 **Presentations**	
18	**Presentations**	
		Final Exam

Project dates and assignments (*used in Fall 2022)

Due dates (on Blackboard)	Assignments
11/28, Monday, by 11:30 pm	*Abstract* Include: Title, group members (names and student ID), short descriptions of your project
12/12, Monday, by 11:30 pm	*PPT slides* Complete and edited version of your talk
12/19, Monday, by 11:30 pm	*Supplemental material* Include anything (resource, data, computations, etc) that are not fully presented/explained in the PPT but you used in your project
Section 1 *12/21, Wednesday 9:00 am – 11:00 am* *12/28, Wednesday 8:15 am – 11:00 am* *Section 2* *12/22, Thursday 4:30 pm – 6:30 pm* *12/29, Thursday 3:40 pm – 6:30 pm*	*Oral presentation* *(15 minutes + 5 minutes Q&A)* **Online**