



暨南大學  
JINAN UNIVERSITY

Academic Inquiries: Jinan University

E-mail: [oiiss@jnu.edu.cn](mailto:oiiss@jnu.edu.cn)

Tel: 86-020-85220399

# JINAN UNIVERSITY

## Linear Algebra

**Lecturer:** Ahmad Mojiri

**Time:** Monday through Friday (June 18, 2018-July 20, 2018)

**Office hours:** 2 hours (according to the teaching schedule)

**Contact Hours:** 60 (50mins each)

**Credits:** 4

**Location:** MBA Center

**Office:** MBA Center 107

**E-mail:** [mojiri@sxu.edu](mailto:mojiri@sxu.edu)

### Course Content

Systems of linear equations, vector spaces and subspaces, linear transformations, determinants, diagonalization of symmetric matrices, inner product spaces and quadratic forms. This is an introductory linear algebra course and it is assumed that students have a higher level of mathematical maturity. Although some proofs will be necessary for understanding, the course will stress sound mathematical reasoning over formal proofs. Linear algebra is one of the most applied topics in mathematics. We will try to spend a little time exploring applications of the subject but this will only be if time permits.

### Required Text

‘Linear Algebra and Its Applications, 4th edition, by Lay. This is required.

We will cover most of chapters 1 through 6.

### Course Hours

The course has 25 sessions in total. Each class session is 120 minutes in length. The course meets from Monday to Friday.

**Calculators:** You may use a scientific calculator on all homework and tests but not a graphing calculator. Cell phones must be turned off and put away during tests.

**Assignments and Graded Work:**

**Homework:**

There will be regular homework assignments posted on the course website. It is totally fine and, indeed, encouraged, to help each other solve homework problems, but it is not okay to turn in essentially identical solutions; once you have discussed the problems you should *write the solutions up on your own*. Not all homework problems will be graded.

**Attendance and in-class work:**

Students are expected to be in class every day for the full class period. We will be covering a lot of material very quickly, so if you get behind it will be very difficult to catch up. We will spend some time in class working on problems in groups. Some of this work may be presented or turned in.

**Quizzes:** We will also have regular quizzes possibly including ‘pop’ quizzes.

**Exams:** There will be two midterms and a final exam.

**Grading Policy**

Attendance and In-class Work	5%
Homework	15%
Quizzes	10%
Midterm Exams	40% (20% each)
Final Exam (comprehensive)	30%
<b>Total</b>	<b>100%</b>

**Make-Ups:**

This class will go by *very* quickly. I strongly recommend that you *never* miss class, since it will be very hard to make up the material you missed and, since mathematics is cumulative, you will run the risk of getting hopelessly behind. However, I understand that life happens, so up to two missed classes will not count against you. If you miss a midterm you must have an excellent documented reason and the standard procedure will be to put extra weight on your final exam.

### Grading Scale

The instructor will use the grading system as applied by JNU:

Definition	Letter Grade	Score
Excellent	A	90-100
Good	B	80-89
Satisfactory	C	70-79
Poor	D	60-69
Failed	E	Below 60

### Approximate Day-to-Day Schedule:

#### Week 1:

Monday: Introduction and systems of linear equations (Section 1.1)

Tuesday: Row reduction and echelon forms; vector equations (Sections 1.2 & 1.3)

Wednesday: The matrix equation  $Ax = b$ ; solutions sets of linear equations (Sections 1.4 & 1.5)

Thursday: Linear independence; introduction to linear transformations (Sections 1.7 & 1.8)

Friday: Review, group work and quiz

#### Week 2:

Monday: The matrix of a linear transformation (Section 1.9)

Tuesday: Matrix operations; the inverse of a matrix (Sections 2.1 & 2.2)

Wednesday: Characterizations of invertible matrices; Leontief input-output model (Sections 2.3 & 2.6)

Thursday: Subspaces of  $R^n$ ; dimension and rank (Sections 2.8 & 2.9)

Friday: Test 1

#### Week 3:

Monday: Introduction to determinants; properties of determinants (Sections 3.1 & 3.2)

Tuesday: Cramer's rule; vector spaces and subspaces (Sections 3.3 & 4.1)

Wednesday: Null-spaces, column spaces and linear transformations; linearly independent sets and bases (Sections 4.2 & 4.3)

Thursday: The dimension of a vector space; rank; change of basis (Sections 4.5, 4.6 & 4.7)

Friday: Review, group work and quiz

**Week 4:**

Monday: Eigenvalues, and eigenvectors (Section 5.1)

Tuesday: The characteristic equations (Section 5.2)

Wednesday: Diagonalization (Section 5.3)

Thursday: Eigenvectors and linear transformations; complex eigenvalues (Sections 5.4 & 5.5)

Friday: Test 2

**Week 5:**

Monday: Inner product, length and orthogonality (Section 6.1)

Tuesday: Orthogonal sets; orthogonal projections (Sections 6.2 & 6.3)

Wednesday: The Gram-Schmidt process (Section 6.4)

Thursday: Review

Friday: Final Exam

**Caveat:** This syllabus is subject to change in the event of extenuating circumstances.

**Academic Honesty**

Jinan University defines academic misconduct as any act by a student that misrepresents the students' own academic work or that compromises the academic work of another scholastic misconduct includes (but is not limited to) cheating on assignments or examinations; plagiarizing, i.e. misrepresenting as one's own work any work done by another; submitting the same paper, or substantially similar papers, to meet the requirements of more than one course without the approval and consent of the instructors concerned; sabotaging another's work within these general definitions, however, Instructors determine what constitutes academic misconduct in the courses they teach. Students found guilty of academic misconduct in any portion of the academic work face penalties ranging from lowering of their course grade to awarding a grade of E for the entire course.