Linear Algebra

Winter/Spring 2026

Instructor: Atul Singh ARORA

Last updated: Thursday Jan 8, 2026

I am teaching this course for the first time so some wrinkles will need to be ironed out as we go along. There will be a few potentially unusual aspects to this course.

- **Declaration.** Given that this is a rather large class, you will be asked to explicitly sign a declaration stating that you will abide by certain rules, while in attendance.
- **Feedback.** At the end of each lecture, you will get two minutes to fill out an online feedback form for that lecture. Being honest in the feedback is encouraged and carries no negative repercussions. Not filling the feedback form, however, may be used to cancel your attendance—although we only intend to use this as a last resort. The idea is to get feedback early and adapt the teaching accordingly.
- **Recordings.** The lectures will be recorded and made available shortly after being delivered. We will also make the lecture notes available.
- **Sync.** To ensure we are not falling behind the other sections (for the same course), we may provide you with recordings for certain topics that couldn't be covered in class.

I hope you will enjoy the course and by the end of it, have a solid grasp of the subject.

Grading Plan

Type of Evaluation	Weight (%)
Assignments	30
Quiz	20
Two Exams (mid-semester and final)	50 (20 + 30)

Total Score Formula. During the mid-semester and final exam, there will be *additional* questions that would be taken verbatim at random from the assignments. Suppose you scored η fraction of these questions right (you will get partial credit for solving a question partially). Then, your final score would be computed as

$$\eta \cdot a + q + e_1 + e_2$$

where a is the score you obtained for your assignment, q is your quiz score, e_1 is the mid-sem score and e_2 is the final exam score.

Motivation. The intent is that if you do your assignments properly, you are likely to get $\eta = 1$ and $a = 30$. However, if one decides to simply copy their assignments, they may get $a = 30$ but η would likely be 0 and therefore this would not contribute anything to their final score.

Example. To be concrete, suppose one obtained the following scores
Assignments: $a = 25$
Quiz: $q = 18$

Mid-sem exam: $e_1 = 17$ (i.e. excluding the *additional* questions taken from assignments)
End-sem exam: $e_2 = 25$ (again, excluding the *additional* questions)

Additional questions (Mid-sem): 15 points out of (say) 30 points
Additional questions (End-sem): 20 points out of (say) 30 points
Scaled score: $\eta = \frac{15+20}{30+30} = 0.5833 \ldots$

Then the total score will be approximately (using the formula above):

$$(0.5833) \cdot 25 + 18 + 17 + 25 = 74.5825$$

NB. While we have made our best effort to be unambiguous with the grading scheme/syllabus/exams etc., in case of any controversy or confusion, the decisions made by the instructors will be considered final. You are encouraged to seek any clarification, should it be needed, in advance to avoid difficulties later.

Topics

Here is a tentative plan of the topics we intend to cover.

Textbook	Topic	Number of Lectures
Hoffman and Kunze	Linear Equations (Ch 1.1 to 1.6)	2 to 3
	Vector Spaces (Ch 2.1 to 2.6)	4 to 5
	Linear transformations (until isomorphisms; Ch 3.1 to 3.5)	4
	Linear functionals* + buffer	
Sheldon Axler	Ch 5 (5A, 5C, 5D, 5E)	3
	Ch 6 (6A, 6B, pseudo-inverse*)	3
	Ch 7 (7A-E, F*)	4
	Ch 9C (Determinant)	2

Textbooks

We will use the following textbooks for various parts of the course (you will be told explicitly which is being followed for which topic):

Sheldon Axler. *Linear Algebra Done Right.*
Kenneth Hoffman & Ray Kunze. *Linear Algebra.*

Course page

I will maintain a GitHub page for all the content and we will use Moodle for evaluations and announcements.

- GitHub page: https://donkeydocs.github.io/
- Moodle: https://courses.iiit.ac.in/