

Math 317

THEORY OF LINEAR
ALGEBRA

SECTION A
MWRF 9 – 9:50
CARVER 294

SPRING 2018



Course Description and Objectives

This course will help you understand the structure of Vector Spaces through geometric intuition and matrix algorithms.

Most Linear Algebra courses focus on learning how to compute things like matrix multiplications, determinants, or cross products of vectors without helping you understand what these things mean or represent.

In this course we will use geometric intuition as a key tool to help us understand why we compute things the way we do and what is the structure of the spaces in which these computations take place. When we focus on the structure, we will do quite a bit of proving, but always having meaning and understanding as a basis.

You will need to invest significant effort and time exploring these new ideas. True understanding (and thus,

better grades) only come after you try, fail, and try again.

four main units:

vector spaces

matrix algebra

linear transformations

eigenvalues and eigenvectors

course details

This course is on Canvas. Make sure you are enrolled by logging into canvas.iastate.edu.

The textbook is *Elementary Linear Algebra*, 5th edition, by Andrilli and Hecker.

A graphing calculator will make you a slightly happier person, if you learn how to use it.

how to take this course

This course is not about me “covering” material and you remembering it for the next exam (no course, nor your own teaching, should be like that). It is about how deep you choose to go. It is about you striving to understand new ideas in many ways, and sharing your understanding with your classmates. You have a responsibility not just for yourself, but for the whole classroom. A successful course will be one in which we all become a community of mathematics learners.

Course Requirements

This course emphasizes active participation; small group work; exploration and discovery; and communication of mathematical ideas. You are expected to attend class, arrive on time, attend the entire class session, participate, and share in the discussion of assigned problems, readings, and activities. **Learning is not a spectator sport.**

Attendance – If you miss a class, you are responsible for submitting all assignments on time and for all work missed. It is your responsibility to contact a classmate to get class notes, homework assignments, etc. Late homework or projects may be accepted with 10% penalty per late day.

Homework – Homework assignments should be written on a new page. Begin each assignment on a new page, and clearly identify the assignment.

Homework tasks will each be assessed with a 0 – 2 scale. A score of 2 will indicate serious effort with works shown and correct mathematics. A score of 1 reflects the start of a correct idea. No points will be awarded whenever no appropriate solution is attempted.

academic dishonesty

Any student who is caught cheating on an assignment, quiz, or exam will earn a zero for that assignment, quiz, or exam and will be reported to the Dean of Students for academic dishonesty.

Quizzes – I am planning to have a few quizzes, some of which might be unannounced ones.

Tests – Three tests and a comprehensive final exam will be administered during the term. The tests are tentatively scheduled for February 2, March 2, and April 6. The final exam will be during Final Exam week at the time scheduled by the University.

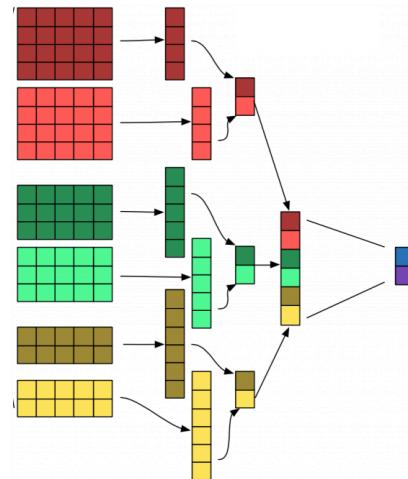
Grades – Final grades will be assigned according to the following scale:

A 90.00-100,
B 80.00-89.99,
C 70.00-79.99,
D 60.00-69.99,
F 0-59.99,

with pluses and minuses given. Incomplete grades are rarely given in accordance to university policies.

special accommodations

If you have a disability and require accommodations, please contact the instructor early in the semester so that your learning needs may be appropriately met. You will need to provide documentation of your disability to the Disability Resources office, located on the main floor of the Student Services Building, Room 1076, 515-294-6624.



Neural Networks, one of the most promising approaches to develop A. I., requires tons of matrix computations like the ones we will do in this class. The diagram above represents a NN filter involving several of these computations.

grading weights

tests	50%
homework	25%
final exam	25%

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office hours – m 1 - 2, w 11 - 12, r 10 - 11, or by appointment