

# MATH 436

## Linear Algebra

### Sample Syllabus

### Description

This is a course in abstract linear algebra, focusing on finite-dimensional vector spaces over the real and complex numbers and linear operators which act on them. Topics include eigenvalues and eigenvectors, inner product spaces, the spectral theorem, the Cayley-Hamilton theorem, and Jordan canonical form. Successful students will learn to give proofs of abstract statements in linear algebra and use the abstract theory to analyze particular examples.

### Prerequisite

Math 311W, Concepts of Discrete Mathematics. Former experience with computational linear algebra such as Math 220 will be helpful but is not strictly necessary.

### Textbook

Sheldon Axler, Linear Algebra Done Right, 3rd edition. With your Penn State account you can get an eBook version for free [here](#) . However, the book is not exorbitantly expensive, and you should be reading it very carefully. I would strongly consider purchasing the hard copy. The free electronic textbook "Linear Algebra" by Jim Heffron may also be helpful, get it [here](#) .

### Homework

Homework is by far the most important part of the course. The only way to learn advanced mathematics is to do advanced mathematics. Weekly homework assignments will be posted on the webpage most Wednesdays, and they are due in class the following Wednesday. A typical homework set will consist of a reading assignment, 5 exercises to be turned in, and a list of additional textbook exercises that you should complete for yourself. Please write your solutions clearly and carefully,

using complete sentences to explain all steps of your proofs or computations.

If you have to miss class on the due date, you can turn in your assignment early to my box in the McAllister building. Solutions to homework will be posted after class on the day it is due, so late homework will not be accepted for any reason. Your lowest score will be dropped at the end of the semester.

## Collaboration

You are encouraged to discuss homework problems with your fellow students. However, you have to write up your solutions by yourselves and show originality. Please write the names of any students you collaborated with on your assignment.

## Grading

Assignment	% Score
Homework	20%
Exam 1	20%
Exam 2	20%
Final Exam	40%
Total	100%

## Grading Scale

Letter grades will be assigned based on the cumulative score; the ranges corresponding to letter grades will be determined based on the difficulty of the exams and the following rubric:

Letter Grade	Criteria
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A	Able to perform basic computations in linear algebra and recite the definitions from the course. Demonstrates solid understanding of the theoretical aspects of the course.
B	Able to perform basic computations in linear algebra and recite the definitions from the course. Demonstrates some understanding of the theoretical aspects of the course.
C	Able to perform basic computations in linear algebra and recite the definitions from the course.
D / F	Fails to meet the expectations for a C.

Cumulative scores of 80/70/60 will receive at least an A-/B-/C-; however, the final breakpoints may be lowered. Grade ranges will be discussed in more detail after each exam.

## Academic Integrity

Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity is a basic guiding principle for all academic activity at The Pennsylvania State University, and all members of the University community are expected to act in accordance with this principle. Consistent with this expectation, the University's Code of Conduct states that all students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts.

Academic integrity includes a commitment by all members of the University community not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others.

## Accommodating Disabilities

Penn State welcomes students with disabilities into the University's educational programs. Every Penn State campus has an office for students with disabilities. The [Student Disability Resources \(SDR\) website](#) provides contact information for every Penn State campus . For

further information, please visit [Student Disability Resources website](#).

In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: [See documentation guidelines](#) . If the documentation supports your request for reasonable accommodations, your campus disability services office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early as possible. You must follow this process for every semester that you request accommodations.

## **Counseling and Psychological Services**

Many students at Penn State face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients' cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

- [Counseling and Psychological Services at University Park \(CAPS\)](#): 814-863-0395
- [Counseling and Psychological Services at Commonwealth Campuses](#)
- Penn State Crisis Line (Available 24 hrs, 7 days a week): 877-229-6400
- Crisis Text Line (Available 24 hrs, 7 days a week): Text LIONS to 741741

## **Educational Equity / Report Bias**

Penn State takes great pride to foster a diverse and inclusive environment for students, faculty, and staff. Acts of intolerance, discrimination, or harassment due to age, ancestry, color, disability, gender, gender identity, national origin, race, religious belief, sexual

orientation, or veteran status are not tolerated and can be reported through Educational Equity via the [Report Bias website](#).