

Syllabus
Linear Algebra II
Spring 2016

(A) **Instructor:** Prof. Shamgar Gurevich.

Office: VV317.

E-mail: shamgar@wisc.edu.

Time and Location: Tue-Thu 9:30-10:45am, Room 901.

HW Meeting: Tue 17:00-18:30, Room 903.

Office Hours: Tue and Thu 11:00-12:00.

(B) **Grader:** Mr. Jeff Poskin.

Office: VV318.

E-mail: poskin@wisc.edu.

Office Hours: Thu 12:00-1:00.

(C) **Computational Assistant:** Dr. Steve Goldstein.

E-mail: sgoldstein@wisc.edu.

(D) **Textbook (optional):** Linear Algebra - Hoffman and Kunze, Linear Algebra and Geometry - Kostrikin and Manin, Advanced Linear Algebra Lecture Notes - Holt and Rumynin.

(E) **Content:** This is a second course in linear algebra. The main goal is the 'simple' description of operators on finite dimensional vector spaces. We plan to cover (part, probably not all) topics from:

- Diagonalization of linear transformations and matrices.
- Decomposition of polynomials over fields.
- Jordan canonical forms.
- Inner product spaces.
- Operators on inner Product spaces. Spectral theorem.
- Bilinear forms and Sylvester theorem.
- Quadratic forms.

Further topics (only if time permits) might include:

- Dual Space. Determinant. Quotient Space, Tensor Product, Differential Forms.
- Quadratic forms over Finite Fields.
- Groups, Actions, and Symmetries of Platonic Solids.
- Definition and Basic Properties of Representations of Finite Groups.
- Applications.

(F) Grading: There will be weekly homework assignments, weekly quizzes on the homework every Tuesday, one review exam, one midterm exam, and one final exam. The quizzes will be given during the weekly HW meeting on Tuesday. In these meetings, students and the grader will work together to solve and then present solutions to the HW assignments. The grade distribution will be computed as follows:

Review	10%
Quizzes:	30%
Midterm:	35%
Final:	25%

For grade above 93 you will get A, above 86 AB, above 79 B, etc.

(G) Attitude: In our course we will extend our knowledge of the basics of linear algebra which is one of the most important subjects of mathematics. The goal will be to help you develop your skills on how to think about linear algebra. We expect you to be an integral part of the course. i.e., to attend and participate in lectures, to do homework and be tested on them, to take exams, and do a project.

Good Luck!