About this Course

The goals of this course are as follows.

- Learn to solve linear systems
- Learn how to apply linear systems to problems from various disciplines
- Learn how to apply vector space concepts to solve problems involving decomposition, stability, and approximation

Linear algebra is an essential part of the mathematics, science and engineering disciplines. The material in this course will be very important in your future studies.

Course Structure

This course meets four times a week for lectures, where the basic concepts will be introduced. There is also one conference section per week.

- Homework
  The homework assignments will be given on class and listed on the course web page. Completing these exercises is essential to your mastery of the material. Some of the assignments will be problems from the text, but a least two will make use of the on-line WeBWorK server. Homework from the text will be collected in conference and selected problems will be graded. Late homework will not be accepted without prior arrangement with the instructor. Homework scores will count as 20% of your final grade.

Homework papers must include your name and section number on the first page. Homework papers must be stapled. Answers without supporting work will not be graded.

About WeBWorK

WeBWorK is a web-based collection of programs for on-line submission of homework. It was developed at the University of Rochester. WeBWorK provides immediate feedback to students and gives them the opportunity to correct mistakes during the process.

- Exams
  There will be two exams during the term. The midterm will be on February 4 and will count for 35% of your final grade. There will also be a comprehensive final exam on Friday, March 4. This exam will count as 45% of your final grade. There will be no make-up exams without prior arrangement with the instructor.
• **Academic Dishonesty**  
  Any instances of academic dishonesty will be dealt with according to WPI policies. See the web site [http://www.wpi.edu/offices/policies/honesty/](http://www.wpi.edu/offices/policies/honesty/) for details.

• **Course Accommodations**  
  If you need course accommodations, please see me as soon as possible. Any such accommodations must be coordinated through the Disability Services Office.

**Material to be covered**

**Week 1** Linear equations and matrices  
Secs. 1.1, 1.2, 1.3, 1.4, 1.5, 1.6

**Week 2** More on linear systems, linear transformations, matrix operations  
Secs. 1.7, 1.8, 1.9, 2.1

**Week 3** More on matrix operations, subspaces  
Secs. 2.2, 2.3, 2.7, 2.8

**Week 4** Dimension and rank, determinants, vector spaces  
Secs. 2.9, 3.1, 3.2, 4.1

**Week 5** Eigenvalues and eigenvectors, orthogonality  
Secs. 5.1, 5.2, 5.2, 5.3, 6.1

**Week 6** Orthogonal projection, least squares  
Secs. 6.2, 6.3, 6.4, 6.5

**Week 7** Least squares applications, inner product spaces  
Sec. 6.6, 6.7, 6.8