

Text We will be using *A First Course in Linear Algebra*, Suci Edition (version 1.00) by Robert A. Beezer as our primary reference for the basic results of introductory linear algebra. You may purchase a copy at www.lulu.com/linearalgebra. Electronic copies of the textbook will be updated weekly at the book's website (linear.ups.edu), usually on Thursday evenings. The textbook will be supplemented with handouts and preliminary versions of new sections of the text.

Home Page Start at <http://buzzard.ups.edu/courses.html> to locate the WWW page for this course.

Office Hours My office is in the north half of Trailer E, the office number is E9; the telephone number is 879-3564. Making appointments or simple, non-mathematical questions can be handled via electronic mail — my address is beezer@ups.edu. Office hours are Monday, Wednesday and Friday mornings (when we are not in class!). I will always be available during these times on a first-come, first-served basis. If these times are not convenient, please do not hesitate to make an appointment with me for another time. You are also welcome to drop by my office without an appointment at any time that I am in (roughly 2:15 P.M. – 4:30 P.M. MWF are good times to try). Office hours are your opportunity to receive extra help or clarification on material from class, or to discuss any other aspect of the course.

Homework There will be a limited number of exercises provided. However, you should also be able to consult other sources to find additional problems. It is your responsibility to be certain that you are learning from these exercises. If you are unsure about a problem, then a visit to my office is in order. Making a consistent effort outside of the classroom is the easiest way to do well in this course.

Mathematics not only demands straight thinking, it grants the student the satisfaction of knowing when he [or she] is thinking straight.

— D. Jackson

Mathematics is not a spectator sport.

— Anonymous

I hear, I forget.

I see, I remember.

I do, I understand.

— Chinese Proverb

An education is not received. It is achieved.

— Anonymous

Exams There will be three exams. Anticipated dates for these are listed on the tentative schedule. You will be given at least a week's notice of the exact date. Each exam will consist of a take-home computational portion and an in-class theoretical portion.

Calculators This course requires the use of the computer program *Mathematica* for the computational portion of the exams. Mathematica is available on university lab computers and limited-time student copies of Mathematica are available at good prices — see the course web page for links. Being unfamiliar with *Mathematica*, or not having arranged access to a university account or lab, are not excuses for poor performance on examinations.

Projects A significant portion of the course will be a research project into an advanced topic or application. This will be a 5–10 page written report and a 25 minute presentation to the class. Papers will be produced with the T_EX language and presentations will be created as PDF's with Beamer. There will be a separate handout describing the projects in more detail.

Grades Grades will be based on the following breakdown: Exams — 75%; Projects — 25%. Attendance will be considered for borderline grades. Scores will be posted on the Internet at <http://buzzard.ups.edu/courses.html>. A reminder about withdrawals — a Withdrawal Passing grade (W) can only be given during the third through sixth weeks of the semester, after that time (barring unusual circumstances), the appropriate grade is a Withdrawal Failing (WF), *even if your work has been of passing quality*. See the attached schedule for the last day to drop with an automatic 'W' and please read *Academic Handbook* at <http://www.ups.edu/x4727.xml#withdrawal> about these often misunderstood grades.

Attendance Daily attendance is required, expected, and overall a pretty good idea.

Purpose This course is about *advanced* topics in linear algebra. We will review topics from Math 232/290 quickly and at a higher level than in the introductory course. We will spend more time in class on proofs and theoretical ideas, leaving you to study the computational aspects outside of class. At the end of the course, you should

- Understand the main ideas of Math 232/290 at a deeper level.
- Understand the generalization of diagonalization to Jordan canonical form.
- Appreciate the range of additional topics that are part of the study of linear algebra, such as matrix decompositions, and how they build on the foundational ideas of Math 232/290.
- Appreciate the wide applicability of linear algebra in other areas of mathematics and science.
- Have learned how to use a modern mathematical word processor and presentation software.
- Have learned how to use a modern computer algebra system.
- Have carefully researched an advanced topic or application yourself and presented it to your peers.

Schedule Given the nature of the course, the schedule is subject to change, and therefore the authoritative version will be maintained on the course web page. Here are some significant (projected) dates:

Jan 17 – Jan 26 Math 232/290 review

Jan 29 – Feb 12 Jordan canonical form

Feb 14 Exam #1

Feb 16 – Mar 7 Advanced topics

Mar 9 Exam #2

Mar 19 – Apr 9 Applications

Apr 11 Exam #3

Apr 13 MAA Meeting, Linfield College (OR)

Apr 16 – May 2 Project Presentations