Text   We will be using *A First Course in Linear Algebra*, (Version 2.20) by Robert A. Beezer as our textbook. We will be doing a mass-purchase as a class in the first couple of days. Electronic copies of the textbook can be found at the book's website (`linear.ups.edu`). These may be updated weekly, usually on Wednesday evenings, but Version 2.20 will be the canonical text for the entire semester.

The Bookstore also has a *highly* recommended optional text: *The Nuts and Bolts of Proofs* by Antonella Cupillari (Third Edition). The course WWW page has some recommendations for similar books about proof techniques.

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

Office Hours   My office is in Thompson 303; 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 10:00-10:50 on Monday and Friday, and 9:30-11:50 on Tuesday and Thursday. You may make an appointment for other times, or just drop by my office. Office hours are your opportunity to receive extra help or clarification on material from class, or to discuss any other aspect of the course.

Calculators   This course requires the use of a calculator. It should be capable of doing matrix operations — specifically "reduced row echelon form," "determinants" and "eigenvalues and eigenvectors." I am most familar with the Texas Instruments series. If you no longer have a manual for your calculator, there is a good chance you can locate one on the Internet.

You may also opt to use the mathematical software *SAGE* which may be used via the campus Sage server at `sage.pugetsound.edu`, including the option of using it on a laptop during exams.

Being unfamiliar with your calculator, using an insufficient model, forgetting to install fresh batteries, or forgetting your calculator all together are not excuses for poor performance on examinations. In particular, I have seen students have trouble making the TI-83 perform all the functions required for this course.

Homework   There is a nearly complete collection of exercises in the text. Any (or all) of the problems will be good practice as you learn this material. Many of these problems have complete solutions in the text to further aid your understanding. Of course, you are not limited to working *just* these problems.

None of these problems will be collected, but instead they will form the basis for the classes where we will have near-weekly "Problem Sessions" and for discussions in office hours. It is your responsibility to be certain that you are learning from these exercises. The best ways to do this are to work the problems diligently as we work through the sections (see attached schedule) and to participate in the classroom discussions. 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 seven 50-minute timed exams — they are all listed on the *tentative* schedule. The lowest of your seven exam scores will be dropped. The comprehensive final exam will be given on Friday, May 14 at Noon. The final exam cannot be given at any other time and also be aware that I may allow you to work longer on the final exam than just the two-hour scheduled block of time. In other words, plan your travel arrangements accordingly.

As a study aid, I have posted copies of old exams on the course web site. These are offered with no guarantees, since techniques, approaches, emphases and even notation will change slightly or radically from semester to semester. Some of the solutions contain mistakes, and some of the problem statments have typos. In other words, they are not officially part of this semester's course. In particular I do not advocate working old exams as a primary, or exclusive, technique for learning the material in this course. **Use at your own risk**: they have not been reviewed for minor mistakes or inconsistencies with this semester's course.

Writing This course has been designated as part of the University's Writing in the Major requirement. Thus, there will be two proofs assigned for each chapter. You will be expected to formulate a proof, and write it up clearly. These will be graded on a pass/fail basis. Each chapter's questions will be returned to you with comments, and if you do not earn a pass, then you can resubmit them the next week. You may resubmit a problem for several consecutive chapters in a row, *so long as you make a serious effort each chapter on an old problem.* Once you miss submitting a retry, it will be marked as a fail. These will be due the day of the chapter exam, in class.

These problems **are your own work** (i.e. no collaboration on formulating the proof, or writing it), and will not be accepted late.

Reading Questions Each section of the textbook contains reading questions at the end. Once you have read the section *prior* to our in-class discussion, submit your responses to the reading questions via electronic mail as follows. Do **not** send your responses to my regular email address (`beezer@ups.edu`), but instead use the address `linear@beezer.privacyport.com` Your responses are due at 6 AM of the day we discuss the section in class, and will not be accepted late, i.e. 6 AM is a firm deadline. Use a subject that is **only** the acronym for the section. So for example, your first response will be simply titled: WILA. Do not include anything else in the subject line. In the first line of your response, please put your real name, then answer the questions in order. If you are not getting replies from me within 24 hours of submission, something is amiss and we will need to figure out where your responses are going. In particular, notice that the email address **does not** include the word "report."

If a question asks for a computation, you can just give the numerical answer, no need to show your work in the email. If the question requests a yes/no answer, or asks "Why?" then give an explanation. Do your best with mathematical notation, but do not fret if it is a bit sloppy or weird,

I can usually decipher any reasonable attempt. Please send *only straight text* — no attachments, no Word files, no graphics, no HTML if you can help it. Please pay careful attention to these procedures and deadlines.

Grades   Grades will be based on the following breakdown: Exams — 55%; Reading Questions — 10%; Writing — 15%; Final — 20%. Homework, attendance and improvement will be considered for borderline grades. Scores will be posted anonymously on the World Wide Web at `http://buzzard.ups.edu/courses.html`.

Reminders   Here are three reminders about university policies contained in the *Academic Handbook*. These are described thoroughly online, or a printed copy may be requested from the Registrar's Office (basement of Jones Hall). See `http://www.pugetsound.edu` `/student-life/student-resources/student-handbook/academic-handbook/`

"Regular class attendance is expected of all students. When non-attendance is in the instructors judgment excessive, the instructor may levy a grade penalty or may direct the Registrar to drop the student from the course." (Registration for Courses of Instruction section)

Withdrawal grades are often misunderstood. A Withdrawal 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'. (Grade Information and Policy section)

All of your graded work is expected to be entirely your own work. Anything to the contrary is a violation of the university's comprehensive policy on Academic Honesty (cheating and plagiarism). Discovered incidents will be handled strictly, in accordance with this policy. Penalties can include failing the course and range up to being expelled from the university. (Academic Integrity section)

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

Purpose   This course is much different from most any mathematics course you have had recently, in particular it is much different than calculus courses. We will begin with a simple idea — a linear function — and build up an impressive, beautiful, abstract theory. We will begin computationally, but soon shift to concentrating on theorems and their proofs. By the end of the course you will be at ease reading and understanding complicated proofs. You will also be very good at writing routine proofs and will have begun the process of learning how to create complicated proofs yourself.

You will see this material applied in subsequent courses in mathematics, computer science, chemistry, physics, economics and other disciplines (though we will not have much time for applications this semester). You will gain a "mathematical maturity" that will be helpful as you pursue upper-division coursework and in any logical, rational, or argumentative activity you might engage in throughout your lifetime. It is not easy material, but your attention and hard work will be amply repaid with an in-depth knowledge of some very interesting and fundamental ideas, in addition to beginning to learn to think like a mathematician.

Tentative Daily Schedule

Monday	Tuesday	Thursday	Friday
Jan 18 MLK Day	Jan 19 Section WILA	Jan 21 Section SSLE	Jan 22 Section RREF
Jan 25 Section TSS	Jan 26 Problem Session	Jan 28 Section HSE	Jan 29 Section NM
Feb 1 Problem Session	Feb 2 Exam Chapter SLE	Feb 4 Section VO	Feb 5 Section LC
Feb 8 Section SS	Feb 9 Problem Session	Feb 11 Section LI	Feb 12 Section LDS
Feb 15 Section O	Feb 16 Problem Session	Feb 18 Exam Chapter V	Feb 19 Section MO
Feb 22 Section MM	Feb 23 Section MISLE	Feb 25 Section MINM	Feb 26 Problem Session
Mar 1 Section CRS Last day to drop	Mar 2 Section FS	Mar 4 Problem Session	Mar 5 Exam Chapter M
Mar 8 Section VS	Mar 9 Section S	Mar 11 Section LISS	Mar 12 Problem Session

Spring Break

Monday	Tuesday	Thursday	Friday
Mar 22 Section B	Mar 23 Section D	Mar 25 Section PD	Mar 26 Problem Session
Mar 29 Exam Chapter VS	Mar 30 Section DM	Apr 1 Section PDM	Apr 2 Section EE
Apr 5 Problem Session	Apr 6 Section PEE	Apr 8 Section SD	Apr 9 Problem Session
Apr 12 Exam Chapters D & E	Apr 13 Section LT	Apr 15 Section ILT	Apr 16 Section SLT
Apr 19 Problem Session	Apr 20 Section IVLT	Apr 22 Problem Session	Apr 23 Exam Chapter LT
Apr 26 Section VR	Apr 27 Section MR	Apr 29 Section CB	Apr 30 Problem Session
May 3 Exam Chapter R	May 4 Housekeeping		

Final Examination
Friday, May 14, Noon