Course Guidelines
University of Puget Sound
Dr. Beezer

Advanced Linear Algebra
Math 420
Spring 2014

Texts Topics presented in class will come from several sources.

1. *A First Course in Linear Algebra*, by Robert A. Beezer. Free online at http://linear.pugetsound.edu, along with information about purchasing physical copies.

2. *Matrix Computations*, by Gene H. Golub, Charles F. Van Loan, 4th Edition. Comprehensive reference, well worth owning. Be certain to purchase new 4th Edition. Available at UPS Bookstore.

3. *Numerical Linear Algebra*, by Lloyd N. Trefethen, David Bau, III. Concise, readable treatment of computational linear algebra. See previous email about discount from pulisher when ordering direct. Not being carried by our bookstore.

4. *A Second Course in Linear Algebra*, by Robert A. Beezer. My own project to present this material at an undergraduate level with an open license. More information in class about location and progress.

Course Web Page Course web page can be found from a link off of http://buzzard.ups.edu/courses.html. This page will evolve as the course progresses.

Office Hours My office is in Thompson 303. Making appointments or simple, **non-mathematical** questions can be handled via email — my address is beezer@ups.edu. I read all of my email, usually very shortly after receiving it. Urgency of replying varies. Office Hours are Monday, Tuesday, Thursday, Friday, 3:00–3:50 PM. Office Hours are first-come, first-served, so I do not make appointments for these times, nor do you need to ask me if I will be present for these times. You **may** make an appointment for other times, or just drop by my office to see if I am in. Office Hours are your opportunity to receive extra help or clarification on material from class, or to discuss any other aspect of the course.

Computation Linear algebra is at the heart of many large computations in physics, chemistry, economics, statistics and other disciplines. This course will give you the theoretical tools to understand the subtleties of numerical linear algebra.

For this reason, we will make extensive use of Sage. Since Sage is open source software, it is available freely in many places. Your default installation is the on-campus server at http://sage.pugetsound.edu which will be running the latest version (6.0) and will remain constant all semester. Or you might like using the (experimental) SageMath Cloud at http://cloud.sagemath.com. Availability, version incompatibility or convenience of other sites is not an excuse for not being able to use Sage.

Homework   I will suggest problems as we work through the material. Any (or all) of the problems will be good practice. Of course, you are not limited to working **just** these problems. 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. Making a consistent effort outside of the classroom is the easiest way (only 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

Quizzes   There will be three 50-minute timed quizzes. Dates are all listed on the **tentative** schedule. The third one will be given on Wednesday, May 14 at 4 PM as the final examination. The final exam cannot be given at any other time so plan any travel arrangements accordingly.

Project   A very large portion of this course will be a project on a topic of your choice. I view this as a substantial undertaking, and the deadlines and grading procedures will reflect this. Note that this comprises 2/5 of your course grade and a failure to make an early and serious start could lead to a very low score.

Here are the components:

1. Topic: Please clear your topic with me prior to researching your proposal. This is mostly to be certain you do not duplicate material I will present in class. Do this by dropping in during office hours, rather than making an appointment or asking me after class.

2. Proposal: One-page, printed summary of topics you will cover. Must include a researched and credible list of sources you will be consulting. Deliver to me in class. Sign-ups for presentations will be in the order proposals are accepted.

3. Rough Draft: Must be substantially complete for credit.

4. Paper:

5. Presentation: 20 minutes with 5 minutes for questions. Must be composed in Beamer.

Please note:

1. All credit deadlines are at the beginning of class on the indicated date.

2. Topics, proposals and rough drafts will either be accepted for full credit or returned for a retry. Retries for credit may be submitted up until the credit deadline.

3. You cannot submit work for the next stage of your project until the previous stage has been reviewed and approved. Missing a credit deadline and then failing to give me enough time for a review is not an excuse for being unable to meet the next deadline.

4. Please note the procedures and formats in the table below. Not following these instructions will not extend any credit deadlines.

5. Submissions by email **must** be sent to lineara@privacyport.com.

Grades   Grades will be based on the following breakdown: Quizzes — 20% each; Project — 40%. Attendance and improvement will be considered for borderline grades. Scores will be posted anonymously on the web at a link off the course page.

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

"Regular class attendance is expected of all students. Absence from class for any reason does not excuse the student from completing all course assignments and requirements." (Registration for Courses of Instruction, Non-Attendance)

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, Withdrawal Grades)

All of your graded work is expected to be entirely your own work, this means Reading Questions and writing exercises (see above specifically about writing). Anything to the contrary is a violation of the university's comprehensive policy on Academic Integrity (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)

Conduct   Daily attendance is required, expected, and overall a pretty good idea. Class will begin on-time, so be here, settled-in and ready to go. In other words, walking in the door at the exact time class is to begin is not acceptable. Repeated tardieness and absences will result in grade penalties, in accordance with university policies. Do not leave class during the lecture unless there is a real emergency — fill your water bottles, use the toilet, and so on, **in advance**. Please keep phones in your pocket or bag, unless you are using them to read course material. In short, we are here to learn and discuss mathematics and it is your responsibility to not distract your peers who are serious about their education.

Purpose

Student Accessibility and Accommodation If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Peggy Perno, Director of the Office of Accessibility and Accommodations, 105 Howarth, 253-879-3395. She will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

I request that you give me at least two full working days to respond to any requests from this office.

Classroom Emergency Response Guidance Please review university emergency preparedness and response procedures posted at http://www.pugetsound.edu/emergency/. There is a link on the university home page. Familiarize yourself with hall exit doors and the designated gathering area for your class and laboratory buildings.

If building evacuation becomes necessary (e.g. earthquake), meet your instructor at the designated gathering area so she/he can account for your presence. Then wait for further instructions. Do not return to the building or classroom until advised by a university emergency response representative.

If confronted by an act of violence, be prepared to make quick decisions to protect your safety. Flee the area by running away from the source of danger if you can safely do so. If this is not possible, shelter in place by securing classroom or lab doors and windows, closing blinds, and turning off room lights. Lie on the floor out of sight and away from windows and doors. Place cell phones or pagers on vibrate so that you can receive messages quietly. Wait for further instructions.

Tentative Daily Schedule

Monday	Wednesday	Friday
Jan 20 MLK Day	Jan 22 Syllabus	Jan 24 MathSciNet
Jan 27 Vector Spaces	Jan 29 Linear Transformations	Jan 31 Representations
Feb 3	Feb 5	Feb 7
Feb 10	Feb 12	Feb 14
Feb 17	Feb 19	Feb 21
Feb 24	Feb 26	Feb 28
Mar 3 Quiz 1 Last Day for "W"	Mar 5	Mar 7
Mar 10	Mar 12	Mar 14 Proposals Due

Mid-Term

Tentative Daily Schedule

Monday	Wednesday	Friday
Mar 24	Mar 26	Mar 28
Mar 31	Apr 2	Apr 4
Apr 7 Rough Draft Due	Apr 9	Apr 11
Apr 14 Quiz 2	Apr 16 Presentations 1	Apr 18 Presentations 2
Apr 21 Presentations 3	Apr 23 Presentations 4	Apr 25 Presentations 5
Apr 28 Presentations 6	Apr 30 Presentations 7	May 2 Presentations 8
May 5 Presentations 9	May 7 Presentations 10	May 9 Reading Period

Final Examination (Quiz 3): Wednesday, May 14, 4 PM