Math 6040 – Spring 2019
Applied Linear Algebra

My Contact Information

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Lectures:	MW, 3:30pm - 4:45pm, in Cudahy 131
Office Hours:	Monday, 9:00am – 10:00am Tuesday, 3:00pm - 4:30pm Friday, 2:30am – 4:00pm **and by appointment** (just email me!)

Course Description

The main theme of this course is foundational linear algebra considered from a numerical viewpoint. We focus on solutions of linear systems of equations, eigenvalues and eigenvectors, and transformations. The course emphasizes and illustrates proof and numerical implementation using problems arising in applications. Multivariable calculus and linear algebra are prerequisites.

Textbook

Primary: *Numerical Linear Algebra*, by Lloyd N. Trefethen and David Bau, III.
Secondary: *Applied Numerical Linear Algebra*, by James W. Demmel

D2L

Some course materials will be posted on D2L, and may be accessed through https://d2l.mu.edu. All other course material will be posted on our course page. Please do not email me through the D2L system.

Course Structure

Assessments

Grades will be based on homework, a midterm exam, and a final exam. Homework assignments will be short, usually one problem, assigned at the end of class and due by the start of the next class.

Homework Collaboration Policy

It can be very helpful to study and work with a group. This type of cooperative learning is encouraged; however, be sure that you have a thorough understanding of the concepts as well as the steps used to solve an exercise. You must be able to work through the exercises on your own. Each student must write up her or his assignment individually and independently and must turn in her or his own work.

It is acceptable to use external resources (like the internet) to do your homework. **It is not acceptable to copy large chunks of code or math from these external resources.**

You are required to list all external resources used to complete your assignment. This includes names of any classmates you worked with. Failure to do so may be considered plagiarism.

No late work will be accepted.

Grading Scale

Homework assignments will collectively count for 20% of the final grade. The midterm exam and final exam will each count for 40% of the final grade. Letter grades will be assigned based on the following scale.

A:	$[90, \infty)\%$
A-:	$[85, 90)\%$
B+:	$[80, 85)\%$
B:	$[70, 80)\%$
B-:	$[65, 70)\%$
C+:	$[60, 65)\%$
C:	$[50, 60)\%$
F:	$(-\infty, 50)\%$

Attendance

You are expected to arrive in class on time, having completed any assigned readings and problems, ready to engage in class, ask questions, and discuss mathematics. If a session is missed, you are responsible for obtaining notes from a classmate.

Matlab

Matlab is a programming language and software for numerical computation and visualization. It is one of the most frequently used tools for applied linear algebra, and as such we will use it extensively in this course. Marquette students can download and install Matlab for free from the IT website.

Python

The Python libraries for linear algebra computations are far more advanced than they used to be, due in no small part to the utility of linear algebra to deep learning applications. As a result, we will also use

Python as one of our computational tools. Python is free for anybody to install.

Office Hours

Office hours are scheduled times that I will be in my office available to help you with course material, including topics from lecture, homework questions, revisions, etc. You are *strongly encouraged* to come to office hours frequently! You don't need an appointment, you can come in and out at any time, and often office hours are empty so they are essentially free one-on-one help. Please watch this instructional and informative video about office hours: https://vimeo.com/270014784.

Writing in Latex

Latex is a text editor that enables you to create good-looking mathematical documents. It is very commonly used in mathematics, computer science, physics, engineering, and other STEM fields. The course website has some tutorial information and templates to help you get started, and I'm always more than happy to help out in office hours.

Grading Disputes

If you believe that I have made an error in scoring an assignment, you must bring it to my attention within one week of the graded paper being returned. I will carefully reread, and if necessary rescore, the assignment. Note that the one-week revise/resubmit deadline is still in effect, so if you think you may want to revise/resubmit, then you should bring the score to my attention before one full week.

Classroom Conduct

The classroom is an interactive learning environment in which everyone should feel valued and comfortable. I strongly encourage you to ask questions and give answers throughout the term, even if (particularly if!) you're not sure that your answers are correct. This is an important part of the learning process.

Students in past courses have often told me that they might peek at their phone, or get otherwise distracted, when they see something in the lecture that they already know. Then, they look up a few minutes later and realize that they're already lost and because math lectures build on themselves, they tend to stay lost for the rest of the class period. To prevent this, and in order to not distract your classmates, I ask that you keep your phones away.

Returned Papers

You must retain all returned papers in case of any discrepancy with the recorded grades on D2L. I cannot correct any mistakes in grading or recording of scores without the original document. All concerns regarding grades on assignments must be brought to me within one week of the return of the paper.

Accommodations and Special Needs

If you have a disability and require accommodations, please contact your instructor during the first week of class so that your learning needs may be appropriately met. You will need to provide documentation of your disability to the Office of Disability Services. If you are unsure of what you need to qualify for services, visit the Office of Disability Services' website at http://www.marquette.edu/disability-services or contact their office by phone at (414) 288-1645.

Excused Absences

Students with absences due to legal obligations, religious observances, or participation in Division 1 athletics and other university sanctioned events will be given an opportunity to make up examinations or other graded assignments, if a request is made to the instructor prior to the absence. After all absences, excused or unexcused, you are responsible for contacting your classmates to obtain lecture note and any other missed materials.