

Applied Linear Algebra

The University of British Columbia – Math 307 Section 202 – Jan-Apr 2016

- Lectures: T-Th 11am-12:30pm in Leonard S. Klink Room 200
- Instructor: Roger Donaldson
- Email: rdonald@math.ubc.ca
- Office Hours: Th 12:30-1:30pm in Math 238
- Web: [Piazza sign-up](#)

Textbook

There is no required textbook for this course. Instead there is a set of typed notes designed for this course, which is available on the [course github site](#).

If you would like to consult a book you may find these useful:

- Linear Algebra and its Applications by Gilbert Strang
- Elementary Linear Algebra with Applications by Howard A. Anton and Chris Rorres

Help is available online for getting started in Matlab, Octave and Python. If you are using Matlab or Octave, you may find this [help page on Matlab/Octave](#) useful.

Outline

This course is organized around a collection of interesting applications. Examples include:

- Interpolation
- Finite difference approximations
- Formula matrix of a chemical system
- Least Squares
- Fourier series
- Graphs and Networks
- Fast Fourier Transforms (FFT)
- JPEG compression
- Power method

- Recursion relations
- The Anderson tight binding model
- Markov chains
- Google PageRank

We will study a selection of these in this class. Each application will be preceded by discussion of the relevant concepts from Linear Algebra. These will be partly review from your previous linear algebra course and partly new material. You will also learn how to do Linear Algebra on a computer using MATLAB or Python.

Grading Scheme

Your grade will be determined by the Written Homework, Midterm, and Exam, as follows

- H = score on Written Homework. Lowest Homework will be dropped
- M = score on Midterm
- E = score on Final Exam

$$\text{Final Grade} = 0.15 * H + 0.35 * M + 0.50 * E$$

The instructor reserves the right to revise or round off grades if the circumstances warrant. Scaling of the raw grade may be required to ensure consistency from section to section and year to year.

Midterms & Final Exam

There will be a final cumulative exam that will be held in April. There will be one 50-minute written midterm held in class. The midterm date is Tuesday 1 March.

If a student misses a midterm, that student shall provide a formal documented excuse such as a doctor's note within one week or a mark of zero (0) will be entered for that midterm. If you are to miss a midterm due to religious observance, two weeks written notice is required by the student. See the UBC full policy on this for more information. There will be NO make-up midterms. Any tests missed with legitimate reasons will have their final exam re-weighted

Assignments

There will be weekly written homework assignments assigned in class. The written homeworks are due at the beginning of class on their due dates. Late homework will not be accepted, but the lowest homework grade will be dropped.

Extra help

Drop-in Tutorials: There is a drop-in tutorial centre located on the third floor of LSK. The AMS offers [tutoring services](#).

Cheating

It is the student's obligation to inform himself or herself of the applicable standards for academic honesty. Students must be aware that standards at the University of British Columbia may be different from those in secondary schools or at other institutions. If a student is in any doubt as to the standard of academic honesty in a particular course or assignment, then the student must consult with the instructor as soon as possible, and in no case should a student submit an assignment if the student is not clear on the relevant standard of academic honesty.