

Math 313/513 in Spring 2022

Martin Bies

February 17, 2022

Contact

- Instructor: Martin Bies,
- Email: mbies@sas.upenn.edu,
- Office hours: Tuesday, 1-2pm EST (room 4N25).
- Grader: Enzo Bergamo,
- Email: ebergamo@seas.upenn.edu,
- Office hours: Monday, 4-5pm EST (room 4C9).

Lecture – Generalities

- Lecture times: Tuesday and Thursday, 10:15am – 11:45am.
- Lecture modus: Online via zoom and Canvas until further notice – lecture notes will be provided.
- Webpage:
 - <https://catalog.upenn.edu/courses/math/>,
 - <https://martinbies.github.io/teaching/>.
- Textbook: Gilbert Strang, Introduction to Linear Algebra, Fifth Edition (2016), ISBN: 978-09802327-7-6,
- Prerequisites: Math 240 or 260. Elementary programming skills in Python.

Lecture – Outline

This course covers topics from linear algebra such as:

- basic notions of linear algebra (vector spaces, linear maps, basis, ranks, ...),
- solving linear equations (Gaussian and Gauss-Jordan elimination, determinant, ...),
- matrix decompositions such as LU, LDU, SVD, ... ,
- eigenvectors and eigenvalues, diagonalizability,
- orthogonal transformations, unitary transformations and the spectral theorem.

We exemplify these concepts in applications. These include:

- Markov processes, Markov matrices and steady-state vectors,
- ODEs,
- Fourier analysis,
- linear regression,
- theorem of principal axes in classical mechanics.

Homework

- There will be weekly homework assignments.
- This course has a **computational** focus. The homework assignments will include programming tasks. Basic familiarity with the programming language Python is expected.

Exams and grading

All exams are (as of this writing expected to be) in person. The grades will be determined as follows:

- Homework: 30%
- Mid term 1 (Tuesday, February 8, 10.15-11.45 EST, room 4C6 DRL): 20%
- Mid term 2 (Tuesday, March 1, 10.15-11.45 EST, room 4C6 DRL): 20%
- Final exam (tentatively on Tuesday, May 3): 30%

Please acknowledge the following:

- Late homework/exam solutions will not be accepted and count as zero, except for reasons such as serious illness, family emergency, etc. In such cases you must provide documentation and use the *Course Absence Report system* in advance. I retain the right to decide how to handle these cases.
- The *Code of Academic Integrity* will be strictly enforced. Cheating on homework or exams (copying/sharing work with other students, etc.) will result in a score of zero on that work and referral to the *Office of Student Conduct*.

Students with disabilities

Any student requiring special accommodations is encouraged to contact me and the *Office of Student Disabilities Services* as soon as possible.

Important Dates

Thursday, January 13	First class
Tuesday, January 25	Course selection period ends
Tuesday, February 10	Mid term 1 (4C6, 10.15-11.45 EST)
Monday, February 21	Drop period ends
Saturday, March 5 – Sunday, March 13	Spring break
Thursday, March 17 (tentative date)	Mid term 2
Friday, March 18	Grade Type Change Deadline
Monday, March 28	Last day to withdraw from course
Tuesday, April 26	Last class
Thursday, April 28 – Sunday, May 1	Reading days
Tuesday, May 3 (tentative date)	Final exam