MAT 310: LINEAR ALGEBRA
SYLLABUS

SPRING 2025

Instructor:
Johan Asplund, johan.asplund@stonybrook.edu, Math Tower 3-116
Class time & location: TuTh 12:30–1:50pm, Humanities 1006
Office and MLC hours: math.stonybrook.edu/cards/asplundjohan.html
Course webpage: math.stonybrook.edu/~jasplund/mat310_spr25

Recitation 01:
TA: Junbang Liu, junbang.liu@stonybrook.edu
Class time & location: W 11:00–11:55am, Library E4315

Recitation 02:
TA: Nate Tausik, nathan.tausik@stonybrook.edu
Class time & location: W 11:00–11:55am, Mathematics 4-130

Recitation 03:
TA: Ceyhun Elmacioglu, ceyhun.elmacioglu@stonybrook.edu
Class time & location: W 11:00–11:55am, Mathematics P-131

Course description: Finite dimensional vector spaces, linear maps, dual spaces, bilinear functions, inner products. Additional topics such as canonical forms, multilinear algebra, numerical linear algebra.

Prerequisites: C or higher in MAT 211 or 305 or 308 or AMS 210; C or higher in MAT 200 or MAT 250 or permission of instructor.

Attendance: Strongly encouraged, but not mandatory.

Textbook: Linear Algebra Done Right (4th edition) by Sheldon Axler. This book is free and available for download at this URL: https://linear.axler.net/index.html.

Brightspace: We will use Brightspace for announcements and grades at the end of the course.

Gradescope: We will use Gradescope for all homeworks. Enroll with the entry code G3D77P.

Homework: There will be weekly homeworks assigned, with problems coming from the book. Therefore you should make sure that you have access to the 4th edition of the textbook (see PDF link above). The homework problems and due dates will be listed on the course webpage.

- Each homework set should be uploaded to Gradescope.
- Late submissions will *not* be accepted.
- The lowest homework score will be dropped at the end of the course.

Exam dates: You must bring your University ID to all exams.

Exam	Date	Time	Location
Midterm I	Tue Mar 4	12:30–1:50pm	TBA
Midterm II	Thu Apr 17	12:30–1:50pm	TBA
Final	Thu May 15	11:15–1:45pm	TBA

Date: January 4, 2025.

Grades: Your final grade will be determined as follows.

Homework:	20%
Midterm I:	20%
Midterm II:	20%
Final:	40%

Makeup exams: Not available. If you e.g. miss one midterm exam with documented evidence (for instance, a letter from Student Accessibility Support Center), the instructor may allow you to shift the weight of the missed midterm exam to the final exam, so that it instead counts with weight 60% in your final grade. A student must attend the final exam at the scheduled time in order to receive a passing grade in the course.

MAT 310 and MAT 315: After the first Midterm exam on March 4, some students will be offered to move up to MAT 315. MAT 315 will cover the same material as in MAT 310 but with a higher pace, and will cover a few additional topics.

Note that if you are invited to join MAT 315 you are not obliged to accept the invitation.

Tentative schedule: See the course webpage for the most up-to-date schedule and for notes. All sections refer to sections in the course textbook.

Week of	Contents	Sections
Jan 28	Vector spaces and subspaces	1A, 1B, 1C
Feb 4	Span, linear independence, bases and dimension	2A, 2B, 2C
Feb 11	Linear maps, null spaces and range	3A, 3B
Feb 18	Matrices and invertibility	3C, 3D
Feb 25	Products, quotients and duality	3E, 3F
Mar 4	Midterm I, Polynomials	4
Mar 11	Invariant subpaces and minimal polynomials	5A, 5B
Mar 18	No class (Spring Recess)	
Mar 25	Upper-triangular matrices and diagonalization	5C, 5D
Apr 1	Commuting operators, inner products and norms	5E, 6A
Apr 8	Orthonormal bases and orthogonal complements	6B, 6C
Apr 15	Self-adjoint and normal operators, Midterm II	7A
Apr 22	Spectral theorem and positive operators	7B, 7C
Apr 29	Isometries and generalized eigenvalues	7D, 8A
May 6	Genralized eigenspace decomposition and Jordan form	8B, 8C
May 15	Final	

Student Accessibility Support Center Statement: If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at `sasc@stonybrook.edu`. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Academic Integrity Statement: Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology and Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at `http://www.stonybrook.edu/commcms/academicintegrity/index.html`.

Critical Incident Management: Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Student Conduct and Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.