MATH 2210Q
Applied Linear Algebra
MW 2:00pm–3:15ppm MCHU 206 Section 001
Spring 2026 Semester

Instructor

Emil Valdez, Monteith 439, tel 860–486–6331
e-mail: emiliano.valdez@uconn.edu
website: https://emiliano-valdez.scholar.uconn.edu/

Office hours

Mondays, 9am–11am, 1–2pm or by appointment (send email)

Prerequisite

MATH 1132Q or MATH 1152Q or MATH 2142Q. Recommended preparation: a grade of C– or better in MATH 1132Q. May not be taken out of sequence after passing MATH 2144Q, 3210, 3510, or 3710.

Course website

http://www.huskyct.uconn.edu/

Course description

Systems of equations, matrices, determinants, linear transformations on vector spaces, characteristic values and vectors, from a computational point of view. The course is an introduction to the techniques of linear algebra with elementary applications.

Course aim and learning objectives

The goal for the semester is to learn, understand, and work with key ideas of linear algebra. These include systems of linear equations, matrices, vector spaces (both concrete and abstract) and their bases, linear transformations, change of basis matrices, eigenvectors and eigenvalues, matrix factorizations, and applications of these concepts. You should not only be able to solve problems similar to ones seen in the homework, but also explain the main ideas of the course clearly and logically. In addition, you should be able to apply the theory in new and creative ways. The course will cover both practical and theoretical topics. A significant part of the course is being able to explain why something is true or false, not just how to compute it. This is important as this course serves as a bridge to more advanced classes you may take in future semesters.

Some general heading of topics covered include:

- Linear equations (Ch 1.1–1,5, 1.7–1.9)
- Matrix algebra (Ch 2.1–2.4)
- Determinants (Ch 3.1–3.3)
- Vector spaces (Ch 4.1–4.6)
- Eigenvalues and eigenvectors (Ch 5.1–5.4)
- Orthogonality and least squares (Ch 6.1–6.5)
- Symmetric matrices and quadratic forms (Ch 7.1–7.2)

Required and other recommended textbooks

Lectures and exercises in the class will be heavily based on the materials covered from the following source:

Linear Algebra and Its Applications, 6th edition, by D.C. Lay, S.R. Lay, and J.J. McDonald, Pearson, 2022.

It comes with an access code to online homework on MyLab Math. This course is part of our course material delivery program, Husky Book Bundle. You can access MyLab Math through HuskyCT. Details of a tentative class lecture program are attached as appendix.

Course assessments

The following table gives the relative weights of the assessment components for the course:

Assessment	Weights	Dates
Class Participation	10%	–
Chapter Homework	15%	–
Class Test 1	20%	February 11
Class Test 2	20%	March 25
Class Test 3	20%	April 22
Final Examination	15%	to be announced
Total	100%	

- Class Participation: This will vary from being called in class, asking questions, demonstrating increased curiosity, and possibly being assigned problems to make up for missing classes when called. When called, you will not be graded based on the accuracy of your answers, but in the manner you reason out for your answers.
- Chapter Homework: There will be one (1) homework assignment for each required Chapter (Ch 1 to 6), with a total of 6. The worst performance will be dropped out in calculating grades. So among the best 5, each accounts for 3% towards your course grade.
- Class Tests: To give you more flexibility, I will take your TWO highest class test scores and weigh them equally with 30% each; use that score to improve your final grade. No make-up exams under any circumstance.
- Final Examination: The coverage for the finals will be announced at a later time.

For additional information on undergraduate grading policies, please visit here: https://registrar.uconn.edu/grades/

Your final grade is determined as follows:

Grade	A	A–	B+	B	B–	C+
Points	[90, 100)	[87, 90)	[84, 87)	[81, 84)	[78, 81)	[75, 78)
Grade	C	C–	D+	D	D–	F
Points	[70, 75)	[65, 70)	[60, 65)	[55, 60)	[50, 55)	[0, 50)

This grading scale may be adjusted if necessary, however, your final grade will be no worse than that determined according to the scale above.

Final examination

Final examination week for Spring 2026 semester takes place from Monday, May 4, through Saturday, May 9. Students are required to be available for their exam during the stated time. If you have a conflict with this time you must visit the Office of Student Services and Advocacy (OSSA) to discuss the possibility of rescheduling this exam.

Please note that vacations, previously purchased tickets or reservations, graduations, social events, misreading the exam schedule and over-sleeping are not viable excuses for missing a final exam. If you think that your situation warrants permission to reschedule, please contact the Office of Student Services and Advocacy with any questions. Thank you in advance for your cooperation.

Please note that final examinations this semester will fall during the religious holiday, Ramadan. As outlined in the University's Religious Accommodation Policy, "The University of Connecticut is committed to providing welcoming and inclusive learning and workplace environments. As part of this commitment, the University will make good faith efforts to provide reasonable religious accommodations to faculty, staff and students whose sincerely held religious practices or beliefs conflict with a University policy, procedure, or other academic or employment requirement, unless such an accommodation would create an undue hardship." Instructors are strongly encouraged to make reasonable accommodations in response to a student request to make-up a final examination missed by absence resulting from observance of Ramadan. An example of a religious accommodation may include the rescheduling of an evening exam to earlier that same day. Please note that instructors should not ask a student for proof that their religious practices or believes are sincerely held or for determining a religious accommodation. Answers to frequently asked questions about the Religious Accommodation Policy can be found here.

How to succeed in this course

My teaching philosophy is that we will all learn the materials together. Everyone can do well in this course and I am always here to help. Please do not hesitate to ask questions or attend office hours. All questions are important here. Your success in this course depends a lot on your personal health and well-being. Stress is a normal part of college experience, and it can get worse with unexpected challenges. I encourage you to see these challenges as steps to success. Take care of yourself throughout the semester, before the demands of exams and projects reach their peak. Please feel free to reach out about any difficulty you may be having that may impact your performance in your courses or campus life as soon as it occurs and before it becomes too overwhelming. In addition to your academic advisor, I also recommend using the many support services available on campus.

If you feel necessary and your needs arise, please consider seeking help from these various departments and offices of the university: Dean of Students Office, Academic Achievement Center, Writing Center, Quantitative Learning Center, Center for Students with Disabilities, Title IX Office, Student Health and Wellness – Mental Health

Husky study groups

Are you interested in forming a study group with other students in the class? There is a study group application in Nexus that can help you get started. Watch this video and click here for more information.

Resources for students experiencing distress

The University of Connecticut is committed to supporting students in their mental health, their psychological and social well-being, and their connection to their academic experience and overall wellness. The university believes that academic, personal, and professional development can flourish only when each member of our community is assured equitable access to mental health services. The university

aims to make access to mental health attainable while fostering a community reflecting equity and diversity and understands that good mental health may lead to personal and professional growth, greater self-awareness, increased social engagement, enhanced academic success, and campus and community involvement.

Students who feel they may benefit from speaking with a mental health professional can find support and resources through the Student Health and Wellness-Mental Health (SHaW-MH) office. Through SHaW-MH, students can make an appointment with a mental health professional and engage in confidential conversations or seek recommendations or referrals for any mental health or psychological concern.

Mental health services are included as part of the university's student health insurance plan and also partially funded through university fees. If you do not have UConn's student health insurance plan, most major insurance plans are also accepted. Students can visit the Student Health and Wellness-Mental Health located in Storrs on the main campus in the Arjona Building, 4th Floor, or contact the office at (860) 486-4705, or `https://studenthealth.uconn.edu/` for services or questions.

Accommodations for illness or extended absences

Please stay home if you are feeling ill and please go home if you are in class and start to feel ill. If illness prevents you from attending class, it is your responsibility to notify me as soon as possible. You do not need to disclose the nature of your illness, however, you will need to work with me to determine how you will complete coursework during your absence.

If life circumstances are affecting your ability to focus on courses and your UConn experience, students can email the Dean of Students at dos@uconn.edu to request support. Regional campus students should email the Student Services staff at their home campus to request support and faculty notification.

Student responsibilities and resources

As a member of the University of Connecticut student community, you are held to certain standards and academic policies. In addition, there are numerous resources available to help you succeed in your academic work. Review these important standards, policies and resources, which include:

- The Student Code
- Academic Integrity
- Resources on Avoiding Cheating and Plagiarism
- Copyrighted Materials
- Credit Hours and Workload
- Netiquette and Communication
- Adding or Dropping a Course
- Academic Calendar
- Policy Against Discrimination, Harassment and Inappropriate Romantic Relationships
- Sexual Assault Reporting Policy

Students with disabilities

The University of Connecticut is committed to protecting the rights of individuals with disabilities and assuring that the learning environment is accessible. Students who require accommodations should contact the Center for Students with Disabilities, Wilbur Cross Building Room 204, (860) 486-2020 or `https://csd.uconn.edu/`.

Privacy Statement: For information on managing your privacy at the University of Connecticut, visit the University's Privacy page. NOTE: This course has NOT been designed for use with mobile devices.

Help

Technical and Academic Help provides a guide to technical and academic assistance.

This course uses the learning management platform, HuskyCT. If you have difficulty accessing HuskyCT, you have access to the in person/live person support options available during regular business hours through the Help Center. You also have 24/7 Course Support including access to live chat, phone, and support documents.

Student technology training

Student technology training is now available in a new HuskyCT short course created by students for students. It will prepare you to use the IT systems and services that you will use throughout your time at UConn, whether learning online or on-campus. It is available at `https://lms.uconn.edu/ultra/courses/_80016_1/cl/outline`.

Evaluation of course experience

Students will be given an opportunity to provide feedback on their course experience and instruction using the University's standard procedures, which are administered by the Office of Institutional Research and Effectiveness (OIRE).

The University of Connecticut is dedicated to supporting and enhancing teaching effectiveness and student learning using a variety of methods. The Student Evaluation of Teaching (SET) is just one tool used to help faculty enhance their teaching. The SET is used for both formative (self-improvement) and summative (evaluation) purposes.

Additional informal formative surveys and other feedback instruments may be administered within the course.

Academic integrity

A fundamental tenet of all educational institutions is academic honesty; academic work depends upon respect for and acknowledgement of the research and ideas of others. Misrepresenting some- one else's work as one's own is a serious offense in any academic setting and it will not be condoned.

Academic misconduct includes, but is not limited to, providing or receiving assistance in a manner not authorized by the instructor in the creation of work to be submitted for academic evaluation (e.g. papers, projects, and examinations); any attempt to influence improperly (e.g. bribery, threats) any member of the faculty, staff, or administration of the University in any matter pertaining to academics or research; presenting, as one's own, the ideas or words of another for academic evaluation; doing unauthorized academic work for which another person will receive credit or be evaluated; and presenting the same or substantially the same papers or projects in two or more courses without the explicit permission of the instructors involved.

A student who knowingly assists another student in committing an act of academic misconduct shall be equally accountable for the violation, and shall be subject to the sanctions and other remedies described in *The Student Code*.

Here are some university guidelines on the use of Generative AI in Teaching and Learning.

Tentative class schedule [1]

Week Number	Week Beginning	Topics Covered	Assessment
1	Jan 20	**Ch 1.1** Sys of Lin Eq; **Ch 1.2** Row Red and Ech Form	
2	Jan 26	**Ch 1.3** Vector Eq; **Ch 1.4** The Matrix Eq $A\mathbf{x} = \mathbf{b}$	
3	Feb 2	**Ch 1.5** Sol Sets of Lin Sys; **Ch 1.7** Lin Indep **Ch 1.8** Intro to Lin Trans	**Homework 1 due**
4	Feb 9	**Ch 1.9** The Mat of a Lin Trans	Class Test 1
5	Feb 16	**Ch 2.1** Mat Ops; **Ch 2.2** The Inv of a Mat **Ch 2.3** Char of Inv Mat; **Ch 2.4** Partitioned Mat	**Homework 2 due**
6	Feb 23	**Ch 3.1** Intro to Det; **Ch 3.2** Prop of Det **Ch 3.3** Cramer's Rule, Vol and Lin Trans	
7	Mar 2	**Ch 4.1** Vec Sp and Subsp; **Ch 4.2** Null, Col and Row Sp **Ch 4.3** Lin Indep Sets; Bases	**Homework 3 due**
8	Mar 9	**Ch 4.4** Coord Sys	**Homework 4 due**
Spring Recess - Mar 15–21			
9	Mar 23	**Ch 4.5** Dim of a Vec Sp/Rank **Ch 4.6** Ch of Basis	Class Test 2
10	Mar 30	**Ch 5.1** Eigenvec and Eigenval **Ch 5.2** The Char Func; **Ch 5.3** Diag	
11	Apr 6	**Ch 5.4** Eigenvec and Lin Trans **Ch 6.1** Inn Prod, Length and Orthog	**Homework 5 due**
12	Apr 13	**Ch 6.2** Orthog Sets; **Ch 6.3** Orthog Proj **Ch 6.4** The Gram-Sch Proc	
13	Apr 20	**Ch 6.5** Least Sq Sol	Class Test 3
14	Apr 27	**Ch 7.1** Diag of Sym Mat; **Ch 7.2** Quad Forms	**Homework 6 due**
Final Examination Period: May 4-9			

[1] any changes will be announced in class or on website