Course Subject, Number and Title
MATH 341 – Linear Algebra

Credits
3

Canvas Course URL
https://canvas.wisc.edu/courses/161807

Course Designations and Attributes
Breadth - Natural Science
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S

Meeting Time and Location
Tuesday/Thursday 1:00pm-2:15pm @ Van Vleck B139

Instructional Mode
Face-to-face

Specify how Credit Hours are met by the Course
This class meets for two 75-minute class periods each week over the fall semester and carries the expectation that students will work on course learning activities (reading, writing, problem sets, studying, etc.) for about 4 hours out of classroom for every class period. The syllabus includes more information about meeting times and expectations for student work.

INSTRUCTORS AND TEACHING ASSISTANTS
Instructor Title and Name
Assistant Professor: Leonardo Zepeda-Núñez

Instructor Availability
Tue 2:15pm-3:15pm Wed 4pm-5pm or by appointment
Office: Van Vleck Hall 809
You have the responsibility of preparing for the exams in due time. No extra office hours will be hold for the midterms nor the final.
A Piazza webpage will be created for the course, the students are strongly encouraged to use it to ask questions and to discuss the course material.

**Instructor Email/Preferred Contact**
zepedanunez@wisc.edu

**OFFICIAL COURSE DESCRIPTION**

Official Course Description
Emphasizes the understanding of concepts in linear algebra and teaches to write and understand proofs in mathematics in general and in linear algebra in particular. Enroll Info: None

**Instructor-Provided Course Description**
Vector Spaces, Linear Transformations and Matrices, Elementary Matrix Operations and Systems of Linear Equations, Determinants, Diagonalization, Inner Product Spaces. Emphasis will be placed on proofs rather than computation.

**Requisites**
MATH 234

**LEARNING OUTCOMES**

Course Learning Outcomes

- Give precise definitions of linear algebraic concepts such as the trace of a square matrix, the definition of a symmetric matrix.
- Prove that a given set is a basis for a vector space.
- Prove or disprove that a given subset is a subspace of a vector space.
- Use properties of a linear transformation in proofs.
- Find a change of basis matrix.
- Solve systems of linear equations.
- Find the basis for the null-space and range of a linear transformation.
- Use theorems about the number of solutions of a system of linear equations.
- Give precise definitions of minors and cofactors of a matrix.
- Compute the determinant of a matrix using various methods such as a formula, row operations, and cofactor expansion.
- Give precise definitions of eigenvalues/eigenvectors.
- Find eigenvalues/eigenvectors.
- Give precise definition of T-invariant subspaces.
- Prove that given subspaces are T-invariant.
- Give precise definition of an inner product.
- Use Gram-Schmidt process to find an orthonormal basis.
- Prove properties of finite-dimensional inner product spaces.
- Use the rank-nullity theorem to compute dimensions and to prove theorems.
- Give precise definitions of one-to-one and onto transformations.
- Know properties of diagonalizable matrices.
- Diagonalize matrices.
GRADING

- No calculators, cell phones, nor other devices will be permitted in exams and quizzes
- Grades will be assigned based primarily on these proportions:
  - Written Homework + Quizzes: 20%
  - First Midterm: 25%
  - Second Midterm: 25%
  - Final Exam: 30%

- The grade of your lowest Midterm will be replaced by your Final Exam grade, if the latest is higher.
- There will be no make-up midterms exams. If you have any conflict with another university related activity you need to contact your instructor before February 4th. After that date no special conflicts will be considered.
- There will be no曲线 in the class, but the instructor reserves the right to modify the final grade lines.

DISCUSSION SESSIONS

There are no discussion sessions associated with this course.

REQUIRED TEXTBOOK, SOFTWARE & OTHER COURSE MATERIALS


EXAMS, QUIZZES, PAPERS & OTHER MAJOR GRADED WORK

To help prepare for the exams we will have a handful of short in-class quizzes. It is your responsibility to attend lectures and quizzes. The lowest score will be dropped.

In addition, homework will be assigned every Thursday, and it will be handed in the following Thursday in Class.

There are two midterm exams and a cumulative final exam. The midterm exams are evening exams.

- Midterm #1: Tuesday, February 25th 7:15PM – 9:15PM.
- Midterm #2: Thursday, April 2nd 7:15PM – 9:15PM.
- Final Exam: Monday May 4th 7:45AM – 9:45PM

HOMEWORK & OTHER ASSIGNMENTS

For the written homework handed in class, you are free to work, share ideas, and collaborate with your classmates; however, you are required to write your own homework and disclaim your collaborators.
RULES, RIGHTS & RESPONSIBILITIES

- To see the Guide’s Rules, Rights and Responsibilities information, refer to http://guide.wisc.edu/undergraduate/#rulesrightsandresponsibilitiesertext.

ACADEMIC INTEGRITY

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison’s community of scholars in which everyone’s academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to studentconduct.wiscweb.wisc.edu/academic-integrity/.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

McBurney Disability Resource Center syllabus statement: “The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA.” http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php

DIVERSITY & INCLUSION

Institutional statement on diversity: “Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.” https://diversity.wisc.edu/