



University of Wisconsin-Madison

Math 340 - Elementary Matrix and Linear Algebra

Credits: 3

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: MWF 12:05 PM - 12:55 PM B102 Van Vleck Hall

Instructional Mode: Classroom Instruction

Specify how Credit Hours are met by the Course: This class meets for **three in-person 50-minute class periods** and one 50-minute in-person discussion period each week over the semester and carries the expectation that students will work on course learning activities (reading, writing, problem sets, studying, etc.) for about 6 hours out of classroom every week. The syllabus includes additional information about meeting times and expectations for student work.

INSTRUCTORS AND TEACHING ASSISTANTS

Instructor Title and Name: Jose Israel Rodriguez, Phd

Teaching Assistants: Dewei Yu and Will Huang

Instructor Availability: 1pm-2pm Wednesday and 11-12pm Friday

Instructor Preferred Contact (Email Replacement Policy): This is a large lecture class. The class will use Piazza as an email replacement.

Please sign up today: <https://piazza.com/wisc/fall2024/fa24math340002>

On Piazza, in addition to posting to the discussion boards, you can send private messages to your TA, your instructor, or to all TAs+Instructor at the same time. See here for details on how to do this <https://support.piazza.com/support/solutions/articles/48000616669-post-a-private-note> or

<https://www.youtube.com/watch?v=swEKerz1ZGA> .

If for whatever reason you feel like you need to send an email, then please do so, but please understand that we may refer you to Piazza.

The instructor's emails is jose@math.wisc.edu

The TA William Huang has email whuang259@wisc.edu

The TA Dewei Yu has email dyu72@wisc.edu

TA Office / Office hours: See Canvas for Office Hours

OFFICIAL COURSE DESCRIPTION

Course Description

An introduction to linear algebra. Topics include matrix algebra, linear systems of equations, vector spaces, sub-spaces, linear dependence, span, basis, rank of matrices, determinants, linear transformations, coordinate representations, kernel, range, eigenvalues and eigenvectors, diagonalization, inner products and orthogonal vectors, symmetric matrices. Covers linear algebra topics in greater depth and detail than MATH 320. Formal techniques in mathematical argument [MATH 341] not covered. Enroll Info: None

Prerequisites

MATH 222

LEARNING OUTCOMES

Course Learning Outcomes

- Express informal mathematical arguments in English using appropriate mathematical terminology and notation.
- Verify if a mathematical object has a given property used in elementary linear algebra (e.g., that a matrix is invertible, that a set is a vector subspace, that a vector is an eigenvector, etc.).
- Recall and state the formal definitions, properties, and theorems associated to elementary linear algebra (e.g., matrix, eigenvector, rank, linear independence, vector space, etc.).
- Resolve algebraic statements related to elementary linear algebra through appropriate computations.

- Check the premises of theorems used in elementary linear algebra in order to apply their conclusions (e.g., that a given matrix has zero determinant and therefore cannot be inverted).

GRADING

Your letter grade will be based on the following weighted components:

Homework: 20%

Discussion Activities: 4%

Midterms: 46%=2x23%

Final: 30%

The following scores correspond to the guaranteed letter grades in this course. The cut-offs may be adjusted slightly in favor of the students at the end of the semester by the instructor.

$$A \geq 92\% > AB \geq 89\% > B \geq 82\% > BC \geq 79\% > C \geq 70\% > D \geq 60\% > F$$

DROP AND MAKEUP ASSIGNMENT POLICY

To be accomodating, we will automatically drop the two lowest scores of your homeworks and two lowest scores of your discussion activities. There are no makeup homework and discussion activities. See **EXAMS** section for drop and makeup policy for exams (midterms and final).

HOMEWORK

Homework is assigned through Canvas using the online homework system MyOpenMath. Several homework sets will be assigned each week and are typically due on Wednesdays at 11:59pm.

- Late homework is accepted for 48 hours after it is due with a 20% penalty on problems completed after the deadline; request an automatic extension from MyOpenMath (via Canvas) **before the deadline** by clicking "Redeem LatePass". Late requests are not accepted. Your two lowest homework scores will be dropped.

- Canvas will update your homework score when you begin working on a homework set. It will say “Assignment Submitted” but you can still work on it before the deadline. Go back into the homework assignment through Canvas Assignments to resume the assignment.
- Each problem has 3 attempts, then generates a new version. You get 20 versions, and the best score is saved. Do NOT waste your attempts.
- If you’re struggling with a problem, please post it on Piazza. If you’d like to show us your work for feedback, please post it privately to the instructors.
- Study tip: Keep a complete written record of your homework, clearly organized by section, assignment, and problem to help you learn the material, minimize mistakes, and review for exams.

DISCUSSION ACTIVITIES

Attendance at your enrolled Discussion section is expected. There will be an in-person assignment at each Discussion session, either an Exit Ticket or Quiz.

- *Exit Tickets* are completed via Canvas in the last 5 minutes of discussion and require a registration code; sharing of registration code with others is considered academic misconduct. Exit Tickets are completion credit and intended to help you reflect on the current material in the course.
- *Quizzes* are in-person, individual, graded quizzes during Discussion. Quiz problems are work-out and are graded on correctness and clarity of explanation. No resources are allowed for Quizzes. They will be returned electronically via Gradescope.

You can see the schedule for Exit Tickets and Quizzes in the Weekly Schedule on Canvas. The **Drop and Makeup Assignment Policy** explains how we accommodate for absences.

EXAMS

Exams in this course are in-person and proctored. There will be two midterms exams and one final exam for this course. Midterm exams will be evening exams. The location will be announced on Canvas before the exam. All exams are closed book, closed notes and no calculators or electronic devices of any kind are allowed.

Collaboration is NOT allowed during exams.

Makeup Exam Policy: If you have a lab or class scheduled at the same time as the midterms you are eligible to take a makeup exam. Makeup times and dates are posted on our Canvas site. Documentation may be required to request a makeup exam. Makeup requests must be submitted **at least a week** before the scheduled exam date. **Makeup requests on the day of the midterm will be denied.**

Dropped Exam Policy: If a student cannot take a midterm or the makeup due to an academic conflict, health conflict, or other university sanctioned conflict, said midterm may be dropped and replaced by the grade on the final exam. All exam drops require prior instructor approval. You must reach out to your instructor BEFORE the exam to discuss if your situation qualifies for a drop. In emergency situations (e.g., a student was unconscious during the exam, so had no way of reaching out to their instructor before the exam), accommodations may be provided without prior authorization.

Only students with three final exams in a 24 hour period or two exams at the same time are eligible per university policies to take a final exam makeup. DO NOT plan any travel for the date of the final exam. Travel plans are not a valid reason to take the makeup exam.

Incompletes may be granted in cases of family emergencies, illnesses, or other unavoidable conflicts.

If a student misses both midterm exams and misses the final as well then that student will not qualify for an incomplete. Students in this situation should contact the Office of Student Assistance and Support (formerly the Dean of Students Office) for guidance.

Exam Information: See this Canvas page for information:

<https://canvas.wisc.edu/courses/417699/pages/exams-information-dates-rooms-makeups-mcburney-info-etc-dot>

Midterm 1: Thursday, October 10th, 7:30pm-9:00pm

- Room: TBD
- Midterm 1 covers 1.1-1.3, 2.1-2.4, 2.6, 3.1-3.3 (before Diagonalization)
- **Midterm 2:** Thursday, November 14th, 7:30pm-9:00pm
 - Room: TBD
 - Midterm 2 covers 3.3 (Diagonalization), 5.1-5.2, 5.4-5.5, 6.1-6.4, 7.1-7.2
- **Final Exam:** Tuesday, Dec 17th, 7:45am-9:45am,
 - Room: TBD
 - Final Exam covers 1.1-1.3, 2.1-2.4, 2.6, 3.1-3.3, 5.1-5.2, 5.4-5.5, 6.1-6.4, 7.1-7.3, 9.1-9.3, 5.3, 10.1-10.2

GRADE APPEALS

All grade disputes must be dealt with within 48 hours after receiving your grade on Canvas. Note that regrade requests will require regrading of the entire problem and may lead to raising, unchanging, or even possibly lowering the original score. Instructors will have all appeals addressed within two weeks after the exam is given. Gradescope grades will be resynced to Canvas AFTER all appeals have been addressed.

COURSE WEBSITE, LEARNING MANAGEMENT SYSTEM AND DIGITAL INSTRUCTIONAL TOOLS

Information about the course material, announcements, lecture notes, assignment submissions, videos, and exam reviews will be posted on the Canvas site.

Recording and privacy policy: Students are not permitted to make recordings (neither video nor audio) in the classroom. The classroom is a place for learning and your fellow classmates deserve privacy and respect during this time. See **PRIVACY OF STUDENT RECORDS & THE USE OF AUDIO RECORDED LECTURES STATEMENT** for more information.

REQUIRED TEXTBOOK, SOFTWARE, AND OTHER COURSE MATERIALS

Note: The book is available freely as a pdf on Canvas.

Title: *Linear Algebra with Applications*

Author: W. Keith Nicholson

Publisher: Lyryx

COURSE WEBSITE, LEARNING MANAGEMENT SYSTEM and INSTRUCTIONAL TOOLS

- Our Learning Management System is Canvas. The site for our course is: <https://canvas.wisc.edu/courses/417699>
- We will use Gradescope for grading exams and quizzes.
- We will use Piazza. This page is a forum for you to discuss the material of this class with other students and your TAs and/or instructor. Posts to this page should be confined to questions regarding the material and logistical questions about the class (e.g., exam dates and locations). Any posts containing comments (either positive or negative) about the instructors, the class, the students, or anything else, will be deleted. Unprofessional conduct may result in disciplinary action. Please do not use email for math questions.
- Some TA and/or instructor office hours may be held remotely. Zoom or MSTeams may be used for this purpose.

RULES, RIGHTS & RESPONSIBILITIES

- See the Guide's [Rules, Rights and Responsibilities](#)

ACADEMIC INTEGRITY

By virtue of enrollment, each student agrees to uphold the high academic standards of the University of Wisconsin-Madison; academic misconduct is behavior that negatively impacts the integrity of the institution. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these previously listed acts are examples of misconduct which may result in disciplinary action. Examples of disciplinary sanctions include, but are not limited to, failure on the assignment/course, written reprimand, disciplinary probation, suspension, or expulsion. (See: <https://conduct.students.wisc.edu/academic-misconduct/> for more information)

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 (UW-855) require the university to provide reasonable accommodations to students with disabilities to access and participate in its academic programs and educational services. Faculty and students share responsibility in the accommodation process. Students are expected to inform faculty of their need for instructional accommodations during the beginning of the semester, or as soon as possible after being approved for accommodations. Faculty will

work either directly with the student or in coordination with the McBurney Center to provide reasonable instructional and course-related accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA.” (See: <https://mcburney.wisc.edu/>)

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/>

COURSE EVALUATIONS

Institutional statement on course evaluations: Students will be provided with an opportunity to evaluate their enrolled courses and their learning experience. Most instructors use AEFIS a digital course evaluation survey tool. In most instances, students receive an official email two weeks prior to the end of the semester, notifying them that anonymous course evaluations are available. Student participation is an integral component of course development, and confidential feedback is important. UW-Madison strongly encourages student participation in course evaluations.

MENTAL HEALTH AND WELL-BEING STATEMENT

Students often experience stressors that can impact both their academic experience and personal well-being. These may include mental health concerns, substance misuse, sexual or relationship violence, family circumstances, campus climate, financial matters, among others.

Students are encouraged to learn about and utilize UW-Madison's mental health services and/or other resources as needed. Visit uhs.wisc.edu or call University Health Services at (608) 265-5600 to learn more.

TEACHING & LEARNING DATA TRANSPARENCY STATEMENT

The privacy and security of faculty, staff and students' personal information is a top priority for UW-Madison. The university carefully evaluates and vets all campus-supported digital tools used to support teaching and learning, to help support success through learning analytics, and

to enable proctoring capabilities. View the university's full [teaching and learning data transparency statement](#).

PRIVACY OF STUDENT RECORDS & THE USE OF AUDIO RECORDED LECTURES STATEMENT

View [more information about FERPA](#).

Lecture materials and recordings for this course are protected intellectual property at UW-Madison. Students in courses may use the materials and recordings for their personal use related to participation in class. Students may also take notes solely for their personal use. If a lecture is not already recorded, students are not authorized to record lectures without permission unless they are considered by the university to be a qualified student with a disability who has an approved accommodation that includes recording. [Regent Policy Document 4-1] Students may not copy or have lecture materials and recordings outside of class, including posting on internet sites or selling to commercial entities, with the exception of sharing copies of personal notes as a notetaker through the McBurney Disability Resource Center. Students are otherwise prohibited from providing or selling their personal notes to anyone else or being paid for taking notes by any person or commercial firm without the instructor's express written permission. Unauthorized use of these copyrighted lecture materials and recordings constitutes copyright infringement and may be addressed under the university's policies, UWS Chapters 14 and 17, governing student academic and non-academic misconduct.

Academic Calendar & Religious Observances

Pursuant to university policy UW-880 (see the link below), students are required to inform their instructors during the first two weeks of class about religious conflicts with quizzes and exams taking place during the semester. Students who will miss quizzes and/or exams during the semester because of religious holidays/observances must email their instructor to inform them of possible conflicts. The instructor will work with the individual student to find suitable alternatives that adhere to university and departmental guidelines. Note that if a conflict is not raised during the initial 2 week period then we cannot guarantee that suitable accommodations will be provided. Because of this, it is vital that students with religious conflicts contact their instructor in a timely manner during the first two weeks of class.

The university policy UW-880 can be found here: <https://policy.wisc.edu/library/UW-880>