

MATH 3323

Matrix Algebra

Syllabus**Optional** MTWR 10:45 am - 11:30 am**Summer I 2022**

Zoom

Instructor: Julio César Urenda CastañedaOffice: CCSB 2.0902 or virtually at [MS Teams: Office](#)

Hours: MTWR 12:25 pm - 1:10 pm

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Hours: TBA

email: TBA@miners.utep.edu**Course Access Points**Announcements: [Piazza](#)Homework and Quizzes: [Gradescope](#)Live Sessions: [Zoom](#)**Prerequisites:** Calculus II (MATH 1312). This is a mathematical maturity requirement.

Course Objectives: This course is concerned with matrices and vectors. In one setting, matrices and vectors merely serve as efficient devices for storing the coefficients and solutions of systems of linear equations. However, the solutions of many such systems are hard to even describe without the correct language. This is the language of vector spaces, where matrices serve as functions turning vectors into other vectors. We will then spend most of our time examining vector spaces, especially various vector spaces we can naturally assign to a matrix. In this setting, eigenvalues and eigenvectors of a matrix arise naturally, and we end the course examining these. Upon completing this course, you will be able to solve and analyze systems of linear equations. You will be able to find and describe the various vector spaces associated with a matrix, and you will be prepared to study more abstract vector spaces. You will be able to compute eigenvalues and eigenvectors of a matrix and know what they are suitable for. You will be able to do all of this equally well with the symbolic/numerical description of matrices and vectors as arrays of numbers and with the geometrical description of matrices and vectors, using the powerful organizing concept of dimension, even in dimensions higher than 3.

Communication This term, we will be using Piazza for class discussion. The system is highly catered to getting you to help fast and efficiently from classmates, the TA, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. If you have any problems or feedback for the developers, email team@piazza.com. Find our class page at [Piazza](#)

Textbook: Introduction to Linear Algebra, 5th ed., Johnson, Riess, Arnold, Chapters 1-4. We will skip some sections, as announced in class. The textbook is required for the entire term.

Required Reading: Read each section that we cover in class, before and after class. Skim it before class, even if you do not understand it fully, to have some idea of what we'll be doing in class. Read it more carefully after class to clarify and fill in details you missed in class.

Warning: Sometimes, we will not "cover" all the material from a section in class but instead focus on a particular aspect. In such cases, I will point out in class which other parts of it I expect you to read on your own.

Grading We use an additive grading criterion: every assignment contains some points. Your final grade is determined by the fraction of the points you obtain over the maximum number of points available. Thus, to decide on your current standing in the class, add up the points you get and divide them by the current maximum number of points. We apply the standard letter grade system based on this fraction g

- A if $0.9 \leq g \leq 1.0$
- B if $0.8 \leq g < 0.9$
- C if $0.7 \leq g < 0.8$
- D if $0.6 \leq g < 0.7$
- F otherwise

Quizzes, Homework, and Participation Suggested homework problems will be assigned most class days and will generally be discussed at the next class. Quizzes consist of problems taken from the homework and readings. Missed quizzes **cannot** be made up. You must do your homework before the due date. You will only learn the material by doing it yourself, not watching others do it for you. Mathematics is not a spectator's game.

Partial Exams There will be three exams; exact dates will be announced in class. Makeup exams can be given only in extraordinary and unavoidable circumstances and with advance notice.

Final The final comprehensive exam will be on

Friday, July 1st

Technology Requirements Ensure your UTEP e-mail account is working and that you have access to the Web and a stable web browser. Google Chrome and Mozilla Firefox are the best browsers for Blackboard; other browsers may cause complications. When having technical difficulties, update your browser, clear your cache, or try switching to another browser.

You will need access to a computer/laptop, scanner, webcam, and a microphone. You will need to download or update the following software: Microsoft Office, Adobe Acrobat Reader, Windows Media Player, QuickTime, and Java. Check that your computer hardware and software are up-to-date and can access all parts of the course.

If you do not have a word-processing software, you can download Word and other Microsoft Office programs (including Excel, PowerPoint, Outlook, and more) via UTEP's Microsoft Office Portal. Click the following link for more information about Microsoft Office 365 and follow the instructions.

IMPORTANT: If you encounter technical difficulties beyond your scope of troubleshooting, please get in touch with the UTEP Help Desk, as they are explicitly trained in assisting with the technological needs of students. Please do not contact me for this type of assistance. The Help Desk is much better equipped than I am to assist you!

Policies

Class Recordings: The use of recordings will enable you to access class lectures and group discussions. If you miss a synchronous or in-person class meeting due to illness or other extenuating circumstances. Our use of such technology is governed by the Federal Educational Rights and Privacy Act (FERPA) and UTEP's acceptable-use policy. A recording of class sessions will be kept and stored by UTEP per FERPA and UTEP policies. Your instructor will not share the recordings of your class activities outside of course participants, including your fellow students, teaching assistants, graduate assistants, and any guest faculty or community-based learning partners with whom we may engage during a class session. You may not share recordings outside of this course. Doing so may result in disciplinary action.

COVID-19 Precautions: Please stay home if you have been diagnosed with COVID-19 or are experiencing COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible so that we can work on appropriate accommodations. If you have tested positive for COVID-19, you are encouraged to report your results to covidaction@utep.edu so that the Dean of Students Office can support you and help with communication with your professors. The Student Health Center is equipped to provide COVID 19 testing.

The Center for Disease Control and Prevention recommends that people in areas of substantial or high COVID-19 transmission wear face masks when indoors in groups of people. The best way Miners can take care of Miners is to get the vaccine. If you still need the vaccine, it is widely available in the El Paso area and available at no charge on campus during the first week of classes. For more information about the current rates, testing, and vaccinations, please visit epstrong.org.

Academic dishonesty: It is UTEP's policy, and mine, for all suspected cases or acts of alleged academic dishonesty to be referred to the Office of Student Conduct and Conflict Resolution for investigation and appropriate disposition. See Section II.1.2.2 of the Handbook of Operating Procedures.

ONLINE ETIQUETTE As we know, sometimes, communication online can be challenging. Given the lack of body language and immediate feedback, we can miscommunicate or misunderstand what our classmates mean. Therefore, please keep these etiquette guidelines in mind. Failure to observe them may result in disciplinary action.

- Always consider the audience. This is a college-level course; therefore, all communication should reflect polite consideration of others' ideas.

- Respect and courtesy must be provided to classmates and the instructor at all times. No harassment or inappropriate postings will be tolerated.
- When reacting to someone else's message, address the ideas, not the person. Post only what anyone would comfortably state in a face-to-face situation.
- Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted in these online spaces is intended for classmates and professors only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space.
- Be reminded that some materials are subject to copyright, and violations are prosecuted, so be cautious about what you share!

Attendance: You are strongly encouraged to attend the optional live transmissions. Students who have demonstrated a lack of effort will be dropped with an "F". You are responsible for finding out any assignment that must be made up if you get behind. My goal is for class meetings and activities to complement, rather than echo, the textbook and thus for every class to be worth attending.

Drop date: The deadline for student-initiated drops with a W is **Friday, June 24th**. After this date, you can only drop with the Dean's approval, which is granted only under extenuating circumstances. I hope everyone will complete the course successfully, but if you are having doubts about your progress, I will be happy to discuss your standing in the course to help you decide whether or not to drop. You are only allowed three enrollments in this course, and students enrolled after Fall 2007 are only allowed six withdrawals in their entire academic career, so please exercise the drop option judiciously.

Courtesy: We all have to show courtesy to each other and the class during class time. Please arrive at class on time (or let me know when you have to be late and why); do not engage in side conversations when one person (me or another student) is talking to the whole class; turn off your cell phone (or, for emergencies, at least set it not to ring out loud), and do not engage in the phone, email, or text conversations during class.

Disabilities: If you have, or suspect you have, a disability and need an accommodation, you should contact the Center for Accommodations and Support Services (CASS) at 747-5148, cass@utep.edu, or Union East room 106. You are responsible for presenting to me any CASS accommodation letters and instructions.

Exceptional circumstances: If you anticipate the possibility of missing large portions of class time due to exceptional circumstances such as military service or training or childbirth, please let me know as soon as possible.

Course Resources: UTEP provides a variety of student services and support:

- Technology Resources
- Help Desk: Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in-person if on campus.
- Academic Resources
 - UTEP Library: Access a wide range of resources, including online, full-text access to thousands of journals and eBooks, plus reference service and librarian assistance for enrolled students.
 - University Writing Center (UWC): Submit papers for writing style and formatting assistance, ask a tutor for help and explore other writing resources.
 - Math Tutoring Center (MaRCS): Ask a tutor for help and explore other available math resources.
 - History Tutoring Center (HTC): Receive assistance with writing history papers, getting help from a tutor, and exploring other history resources.
 - RefWorks: A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.
- Individual Resources
 - Military Student Success Center: Assists personnel in any branch of service to reach their educational goals.
 - Center for Accommodations and Support Services: Assists students with ADA-related accommodations for coursework, housing, and internships.

- Counseling and Psychological Services: Provides a variety of counseling services, including individual, couples, and group sessions, as well as career and disability assessments.

Concept Map:

