

# Syllabus for Math 3203

## Matrix Methods in Science and Engineering

### Instructor Contact Information

<b>Instructor:</b>	Dr. J. Rodney Grisham	<b>Office Phone:</b>	713-489-5099 (Google voice phone)
<b>Office:</b>	Online	<b>Office Hours:</b>	Before or after class or with appointment
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### Welcome to

<b>Course Title:</b>	Matrix Methods	<b>Semester and Year:</b>	Spring 2025
<b>Course Prefix:</b>	MATH	<b>CRN:</b>	21204
<b>Course Number:</b>	3203	<b>Section:</b>	031
<b>Credit Hours:</b>	2	<b>Class Days and Times:</b>	Friday 12:00 - 1:50 PM
<b>Lecture Hours:</b>	2	<b>Classroom Location:</b>	HEC Room 0A217
<b>Total Contact Hours</b>	32		

<b>Canvas Link:</b>	<a href="#">Canvas</a>	<b>Canvas Course Name:</b>	MATH-3203 (2025-SPRING) 031
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### Course Overview

#### Catalog Description:

MATH 3203. Matrices and matrix algebra, determinants, systems of linear equations, Gaussian elimination, eigenvalues and eigenvectors, linear transformation, applications in science and engineering.

#### Course Student Learning Outcomes:

Upon completion of this course, the student should be able to

1. Perform basic matrix operations including row reduction, transpose, finding the inverse, and finding the determinant.
2. Solve systems of linear equations using substitution, Gaussian elimination, and inverse matrices.
3. Compute eigenvalues and eigenvectors of matrices as well as understand their properties and importance to matrix theory and applications.
4. Understand the basic properties of vector spaces including linear independence, dimension, and rank.
5. Apply matrix techniques to real-world applications from science and engineering.

## Getting Ready

**Prerequisites:**

Students are required to have completed MATH 2413 (Calculus I) with a grade of "C" or better.

**Corequisites:**

None

**Required Materials:****Textbook:**

*Linear Algebra and Its Applications*, Edition 6, by Lay, Lay, and McDonald; Pearson; 2021.

Hardbound textbook (only): 978-0-135-85125-8

E-book + MyMathLab Access Card: 978-0-135-85115-9

**Optional Materials:**

Computer Algebra System such as Maple or Mathematica; Microsoft Excel or a similar spreadsheet application.

## Instructor Guidelines and Policies

**Attendance:**

The keys to success in this course are regular attendance, active participation and learning during class, and diligence in completing homework assignments correctly and on time. Attendance is mandatory. Students are expected to arrive on time and to remain in class until the official dismissal time. All absences, tardiness in arrival and return from breaks, early departures, and any other exceptions will be noted. Any unexcused, early departure from class, whether voluntary or involuntary, will be counted as a full day's absence from class (2.0 hours).

Students who accumulate 8 hours or more of absences will be categorized as having excessive absences in the course. If excessive absences make it unlikely the student can complete the objectives of this course, the instructor may recommend that the student drop the course. Alternatively and without notice, the instructor may officially drop the student for excessive absences. However, ultimately it is the student's responsibility to decide whether to drop the course or to receive an "F" as the final letter grade. Note that the State of Texas limits the total number of withdrawals in your college career to six from all state supported colleges and universities.

In case of an absence, it is the student's responsibility to obtain the information and materials which were missed before the next class and to seek help if all parts of it are not fully understood. Students are expected to be prepared for any missed class, as well as the next class, and to complete any assignments for the next class on time.

During each class or substitute Zoom session, all students are expected to conduct themselves as mature adults and in a business-like, professional manner consistent with UT Tyler policy. Failure to follow these guidelines will eliminate any possibility for earning in class participation points. After one warning, offenders will be asked to leave the classroom. During all graded in-class activities, baseball caps and similar items must be removed or turned backwards.

Students may receive disciplinary action up to and including suspension if they violate UT Tyler or campus rules, disrupt classes, or interfere with the opportunity of others to obtain an education. Students who pose a threat to the safety of others will be subject to immediate withdrawal from the classroom, campus environment, and/or online environment, as well as face subsequent criminal charges, as appropriate.

**Class Participation:**

Students are always strongly encouraged to ask questions pertinent to the subject under discussion. To get the most out of each class, it is imperative that questions be asked as they occur to you. The only stupid question is the question that is not asked. If for some reason the first answer does not help your comprehension of the concepts under discussion, then ask again, including an attempt to describe what about the answer still mystifies you. We will be reasonably persistent in choosing different phrases or in using alternative methods to help clarify any confusing concepts. Worst case, we will take the question offline for additional discussion after class.

As previously noted, active participation and learning during class is expected from each student. During time periods when new or review material is being presented, tablet or laptop computers may be used to reference textbook content by students who opted not to purchase the printed textbook. However, this is a privilege, not a right, and it may be terminated at the sole discretion of the instructor, if the privilege appears to be abused.

**Using MyMathLab:**

To supplement class activities, an online (Internet) resource called MyLab Math or MyMathLab (MML) is required. MML is available via any computer with Internet access. Access to MML is directly from UT Tyler Canvas. After logging in to Canvas and selecting this course, select the MyLab and Mastering link in the Course Navigation menu to access the online assignments. When purchased at the bookstore, some new textbook packages include an MML Student Access Kit, a booklet with instructions for MML and a single use, personal access code. Students who purchased a textbook without the Access Kit (used book or otherwise) for this course will need to purchase an access kit separately at the bookstore or online (with a credit card or PayPal).

For students who are registering to use MML for the first time with this textbook, a 14-day free temporary access period is available. It is intended for students who are waiting for their financial aid or who otherwise do not have the money at the beginning of the semester to purchase MyMathLab. Students are strongly encouraged to register immediately and not delay work on MML assignments. Do take advantage of the grace period, if needed. Additional information about registration and MML access is posted to the Getting Started Module in Canvas.

Failure to register and log into MyMathLab by Tuesday, January 28, will subject you to being dropped from the course for non-participation. If the Temporary Access option is used, failure to pay for access before the temporary period expires will lock you out of MML and subject you to being dropped from the course. Inability to access MML from home or another preferred location is not an excuse for not registering and completing the assigned activities. This requirement for this course remains active, despite current limited access to on-campus facilities.

For additional help, utilize one or more of the resources under the [Student Support](#) icon. Alternatively, after you register and enroll in the course, select one or more of the options under the Help icon “?” on the Course Home page.

The next step after registration for MML for this course is to run the MyMathLab Installation Wizard. The wizard will assess browser name, version, and configuration options. For example, pop-ups must be allowed (from the MML website), and recent versions of Java are required. The Wolfram CDF Player may be required for some study aids with animation. The wizard will provide for installation of any browser plug-ins and players needed to access all of the content in the MML component of this course. For this one time during registration and configuration, if any plug-in needs to be added or updated, software installation rights/privileges are required on your local computer.

On the main MML page for the course, you may select from several activities including, but not limited to:

- “Assignments” The homework assignments are required; see below.
- “Study Plan” After completing a (practice) chapter test, follow the personalized study plan to master any concepts with which you had difficulty.
- “Gradebook” View your MyMathLab assignment scores.

- View an online version of the textbook and look at multimedia sources such as on-line video clips and PowerPoint presentations that correspond to topics covered in the textbook.

### Exercises for Competency Assurance:

Expect each section of the textbook which is covered during this course to have one or more types of practice problem suggestions and/or a graded homework assignment.

- **In class Exercises.** As many opportunities as possible will be provided during class periods to practice concepts which are being discussed. However, with the current class format, these activities will be limited. During these segments, work collaboratively, but quietly, with neighbors. If you have questions, ask for assistance. Some of these in-class assignments may be taken up and graded without prior notice. Any such graded problem sets will be due when requested by the instructor at or before the end of the class period and will not be accepted late. There may also be assignments to complete at home that will be a part of this component of the course grade. These projects will have a specific due date and will not be accepted late.
- **Out-of-class Exercises.** A group of problems to complete between class periods may be designated for some sections of the textbook which are covered during the course. Review problems for each chapter will definitely be designated as an aid for preparing for each test. These problems are not to be turned in, unless specifically stated otherwise, but they do provide an additional opportunity to practice the concepts which have been covered during class. To be assured of mastery of the material, be sure to work all suggested problems. You are welcome and encouraged to get help with these problems from tutors, friends, and classmates.
- **MyMathLab Homework Exercises.** Each section of the textbook which is covered during this course will have an assignment to be completed online using the MyMathLab course specific to this section of Math 3203. After logging in to Canvas and selecting this course, select the MyLab and Mastering link in the Course Navigation menu to access the online assignments. Once in MML, select "Assignments" and work the appropriate homework assignment(s). For each problem, you can choose "View an example," or read the appropriate corresponding section of the textbook online. In some cases, a video clip or a PowerPoint presentation is available. However, be sure not to over-use and abuse these tools for assistance. The goal is to master the essential concepts of the course, not to simply manipulate guided steps into answers to homework problems. Each problem is limited to 3 attempts to solve it correctly. When you are finished with an assignment, be sure to select "Submit Homework" to have your results saved and included in your course grade. When assigned, each section will have a definite due date. The due dates are shown in MyMathLab. In addition, for longer term planning, the Content Overview Module in Canvas includes a document that shows all due dates planned for the semester. While late assignments will not be included in the course grade, the assignments will remain available for study and practice. With all of the types of help that are available, including "Ask My Instructor," there is no reason for this component of your course grade not to be nearly perfect. Experience indicates that performance on MML strongly correlates to overall course letter grades, as long as the built-in help tools are not used abusively.

Practice solving problems on each topic is essential for success in any mathematics course. This course is no exception. It is crucial for your success in this course that the suggested or assigned problems be completed in preparation for the following class. Ask at the beginning of the next class, if you are having trouble with any of the designated homework exercises.

Students are admonished to work each problem in a careful, neat fashion, using as many steps as are necessary for their skill and comfort level. Use plenty of paper to spread your work out so that the steps in your solutions are written with correct notation and are clear and orderly. This simple practice will eliminate many careless errors and will facilitate reviews in preparation for following examinations. Paper and pencils are very cheap compared to the value of your time and effort throughout the course. In addition, your instructor facilitates the student's learning experience and grades assignments and examinations, but is not a file clerk, secretary, or editor. The instructor will not search through several pages of work to find an answer for any assigned problem, nor attempt to decipher illegible handwriting.

**Examinations:**

There will be two major examinations and one comprehensive final examination.

Each test will be conducted during class time and will contain free response questions covering recent course topics. Provided complete work is neatly shown, partial credit will be awarded to students who make minor mistakes. As the semester progresses, you are expected to become more accurate with your work. Solve each test problem, paying attention to any specific directions given for that problem. Write the answers on the test. You may use extra paper for solution steps. If you do, turn it in too, ensuring that you have shown all of your work for every problem. To receive credit for the answer(s) for any problem, each answer must be adequately supported with an appropriate initial set-up and a logical progression of solution steps leading to the answer. You must have demonstrated an understanding of the mathematical concepts which each problem is designed to assess. An unsupported numerical answer, however determined, is not sufficient to earn any points.

Final Examination: The final examination will be comprehensive and consist of free response questions. Partial credit will be limited on the final examination. The final examination will be conducted in accordance with the official schedule published by UT Tyler for this semester.

**Calculator Policy:**

Calculators will not be allowed on any in-class graded activity.

**Make-up Work:**

Spring 2025: Unless the Testing Center policies and procedures change during this semester, there cannot be any makeup tests. If the Testing Center does reopen for makeup tests during this course, then the following policies will be effective.

There will be no retests and no early testing. There will be no makeup tests except in special circumstances and then only with written documentation and the instructor's pre-approval. Any tests missed due to extreme emergency, in which the student is unable to obtain prior approval, will require official, written documentation to be excused and will be entirely at the discretion of the instructor. Otherwise, any missed test will be assigned a grade of zero. Requests for more than one makeup test during a semester will not be granted. There are no make ups for missing or late homework, for in-class assignments, for quizzes, or for the final examination.

**Electronic Services and Communication:**

As a courtesy to your fellow classmates and your instructor, for the duration of each class period either turn off or place in a silent vibrate mode all cell phones, personal digital assistants, pagers, and similar electronic devices. Unless you have notified the instructor in advance that an emergency message is likely, do not respond to any electronic messages until a break or after class. Otherwise, cell phones, wired or wireless earpieces, and similar devices are not allowed out during class time. Keep them in your book bag or purse while in class. More specifically, all electronic means of communication are disallowed, including text messaging. The only exception to the prohibition of electronic communication is the appropriate use of a tablet or laptop computer to follow in the online textbook the material being presented and discussed in class. Also, keep in-class conversations at a minimum. Any student who takes out a cell phone or similar device during class or disrupts the class by talking excessively will be asked to leave. Should this occur, it will count as a full day's absence from class.

All electronic devices typically used for entertainment are prohibited. This prohibition includes, but is not limited to, Apple iPods and a variety of competitive products including radio receivers, MP3/WMA players, and their earpieces and other accessories for electronic messaging and entertainment. All such devices are to be turned off and out of sight during class.

**Artificial Intelligence**

UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or

copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the guidelines specified for this course (see below) is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler's Academic Integrity Policy.

For this course, AI use is not permitted. To best support your learning, you must complete all graded assignments by yourself to assist in your learning. This exclusion of other resources to help complete assignments includes artificial intelligence (AI). Refrain from using AI tools to generate any course context (e.g., text, video, audio, images, code, etc.) for an assignment or classroom assignment.

### Academic Integrity:

Make note of your instructor's specific additions to the UT Tyler policies on academic integrity. The university's policies are summarized later in this syllabus and are fully explained in various online documents. It is recommended that students read the *Student Handbook*.

All students are required to exercise academic honesty in completion of all tests and assignments. Cheating involves deception for the purpose of violating academic assessment rules. The instructor considers cheating to include the copying of problem solutions from any source, having someone else complete your work, or submitting group work to which you have not contributed. If I suspect any student has cheated on any graded component, your score will be a zero (non-negotiable). If another student in the class is involved in cheating with you, that person will receive a zero as well. This includes complacency in allowing someone else to copy from your work. For a second offense, the student will receive a grade of "F" in the course. Keep in mind also that whether you are cheating or not, not following testing or writing rules properly, such as communicating with your neighbor or using a cell phone during a test will be construed as cheating. This is not an exhaustive list of the forms of cheating on written work. If you are in doubt, consult your instructor.

### Grade Determination:

Course grade averages will be determined according to measured performance on the following factors in a weighted average.

Component	Component Details	Percent of Course Average
Tests	Each of 2 major tests will be scored on a 100 point basis. See the following Instructional Outline for approximate dates. Exact dates and content will be announced a sufficient time in advance of each test. The two tests are equally weighted.	50
MyMathLab assignments and graded in-class and other homework assignments	Periodic graded assignments will each be scored on a 100 point basis. The lowest grade will be dropped (other than MML) and the remainder will be averaged together with the average score of all MyMathLab assignments, and the combination will be applied to the course grade.	20
Final Examination	At the end of this course, there will be a comprehensive final examination, conducted in accordance with UT Tyler policies.	30
<b>Total:</b>		100

**Letter Grade Assignment:**

Letter Grade	Overall Course Average in Percent
A	90 – 100
B	80 – 89
C	70 – 79
D	60 – 69
F	0 – 59

**Tentative Instructional Outline:**

This schedule is subject to revision if/when necessary as the semester progresses.

**UT Tyler System and Houston Engineering Center Policies****UT Tyler Honor Code**

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

**Students Rights and Responsibilities**

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this [link](#).

**Student Standards of Academic Conduct**

Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

- i. “Cheating” includes, but is not limited to:
  - copying from another student’s test paper;
  - using, during a test, materials not authorized by the person giving the test;
  - failure to comply with instructions given by the person administering the test;
  - possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed “crib notes”. The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
  - using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
  - collaborating with or seeking aid from another student during a test or other assignment without authority;
  - discussing the contents of an examination with another student who will take the examination;
  - divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
  - substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;

- paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
  - falsifying research data, laboratory reports, and/or other academic work offered for credit;
  - taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
  - misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.
- ii. “Plagiarism” includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another’s work and the submission of it as one’s own academic work offered for credit.
  - iii. “Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.
  - iv. All written work that is submitted will be subject to review by plagiarism software.

### COVID-19

It is important to take the necessary precautions to ensure a healthy and successful year. UT Tyler continues to urge you to protect yourselves against the flu, COVID and any new threats that may be developing. Be diligent about preventive measures such as washing hands, covering sneezes/coughs, social distancing, and vaccinations, which have proven to be successful in slowing the spread of viruses. Encourage those who do not feel well to stay home, and if they show symptoms, ask them to get tested for the flu or COVID. Self-isolation is important to reduce exposure ([CDC quarantine/isolation guidelines](#)). Please work with your faculty members to maintain coursework and please consult [existing campus resources](#) for support.

### Campus Carry

We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available [here](#).

Students at the Houston Engineering Center also must follow the policy of HCCS. Refer to the [details](#).

### UT Tyler a Tobacco-Free University

All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors.

Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products.

There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs, visit this [link](#).

### Grade Replacement/Forgiveness and Census Date Policies

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or [online](#). Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.

Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.



The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a “W” grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment.
- Completing the process for tuition exemptions or waivers through Financial Aid.

### **State-Mandated Course Drop Policy**

Texas law prohibits a student who began college for the first time in the fall of 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date. Refer to the Academic Calendar for the specific date for each semester. For the regular 15-week academic session for the Spring semester of 2023, the date is Thursday, March 23.

Exceptions to the six-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Contact the Enrollment Services Center for any questions.

### **Disability/Accessibility Services**

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University offers accommodations to students with learning, physical, and/or psychological disabilities. Students who have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or have a history of modifications or accommodations in a previous educational environment, are encouraged to visit this [link](#) and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact the student when the application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator will be scheduled. For more information, including help filling out an application for services, please visit the SAR [webpage](#), the SAR office located in the University Center, Room 3150, or call 903.566.7079.

### **Student Absence due to Religious Observance**

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

### **Student Absence for University-Sponsored Events and Activities**

For students who intend to be absent for a university-sponsored event or activity, either the student or the event sponsor must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

### **Social Security and FERPA Statement**

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

### **Emergency Exits and Evacuation**

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

**UT Tyler Resources for Students**

- [UT Tyler Writing Center](#) (903.565.5995), or [email](#).
- [UT Tyler Tutoring Center](#) (903.565.5964), or [email](#).
- The Mathematics Learning Center, RBN 4021, is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- [UT Tyler Counseling Center](#) (903.566.7254).