Math 5: 5094
Introduction to Linear Algebra
Spring 2021

Instructor Information

Name: Justin Davis
Office: Office Hours Zoom Link
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Office Hours: MW 1:00 - 1:30pm, T 3:30 - 5:00pm, Th 10:00 - 12:30pm

Class Information

Dates: 1/21 – 5/20 (+ Finals week!)
Time: TTh 7:30 - 9:00am
Location: Class Meeting Zoom Link

Prerequisites

Completion of MATH 1B or higher (MATH)

Course Description, Link to Course Outline of Record

An introduction to linear algebra including the theory of matrices, determinants, vector spaces, linear transformations, eigenvectors, eigenvalues and applications.

Student Learning Outcomes

- Determine the dimensions of a variety of vector spaces.
- Find eigenvalues, eigenvectors and eigenspaces of matrices and linear transformations.
- Determine matrix representations of linear transformations and linear operators.

Course Objectives

After this course, you should be able to. . .

- Solve systems of linear equations using Gauss-Jordan elimination, matrix inverses and Cramer's rule.
- Define operations on matrices, invertibility, elementary matrices, orthogonal matrices.
- Use properties of determinants including row reduction to evaluate determinants.
- Invert matrices using adjoints and cofactors.

- Define vector spaces, subspaces, span, linear independence, bases, dimension, inner product spaces, and orthonormal bases.
- Determine the nullspace or kernel and range of a matrix and linear transformation.
- Determine the injectivity and surjectivity of linear transformations and linear operators.
- Define and determine dimension, rank and nullity of a matrix.
- Determine the matrix representation of a linear transformation using different bases and using change of basis.
- Determine eigenvalues, eigenvectors and eigenspaces of matrices and linear transformations.
- Apply proof writing techniques to prove basic results in linear algebra.

Textbook, Calculators, & Software

Textbook: *Understanding Linear Algebra*, by David Austin.

*This book is free! Here is the HTML Version, and here is the PDF

Calculator: You will need a calculator to do the computations that will arise throughout the course. No specific calculator is required; you may use a TI if you please. I will show you some online calculators that we can use as well. We may use some software as well.

Homework

The homework assignments will be accessed and submitted *directly in our Canvas course*. Most of the time they will be due weekly by 11:59pm on Friday night. **THERE ARE NO EXTENSIONS OR MAKE-UPS!! BECAUSE OF THIS, YOUR LOWEST 2 HOMEWORK ASSIGNMENTS WILL NOT COUNT TOWARD YOUR FINAL HOMEWORK GRADE.**

*Note: You will most definitely encounter exercises during homework that are more difficult than examples we have seen in class. This is good. It is extremely important for your learning to focus on these (and even struggle a bit). Of course, I am here to support you in class and in office hours. The SRJC Math Lab is also a great place to get help.

Labs, Mini-Projects & In-Class Assignments

There will be labs/mini-projects and several other assignments during the semester that consist of exercises that I think are engaging and challenging. It will be useful to work with others on these. For the sake of promoting participation and attendance (and for learning obviously), I also assign graded classwork randomly throughout the semester. **Again, there are no make-ups or extensions for these assignments, so I will drop the lowest score in this category.**

Exams

There will be 3 timed midterm exams in Canvas, and these will be worth half of your overall grade. **THERE ARE NO MAKE-UPS OR EXTENSIONS. MISSING AN EXAM WILL RESULT IN A SCORE OF ZERO ON THAT EXAM.** If you take all 3 midterms, the percentage on your final exam will replace your lowest midterm percentage (given that it is better).

The final will consist of problems that encompass what we have learned throughout the semester. This will be worth 20% of your overall grade.

Class Attendance and Participation

It is essential to your success in this course that you attend each lecture and participate in the discussions. There will be In-class group activities. Therefore, you are expected to attend each lecture and to show up on time. You are responsible for any material covered, any work assigned, or any course changes made during the lecture.

Grading

The course grade is determined by the following components:

Canvas Exams (3 of them)	50%
Final	20%
Labs, Mini-Projects & Classwork	20%
Homework	10%

Final grades will be assigned according to the following scale:

A	90% – 100%
B	80% – 89%
C	70% – 79%
D	60% – 69%
F	0% – 59%

*Note: If you are <1% away from the next letter grade up, I do round this up.

Important Dates

- January 31: Last day to drop semester length class and be eligible for a refund.
- February 7: Last day to drop a semester length class without “W” symbol.
- April 25: Last day to drop a semester length class with “W” symbol.
- May 25: Final Exam

Getting Help

Be proactive about your success in the course! If you need help, there are many resources available to help you. Your first primary contact for help is me, the instructor. If you are struggling, attend office hours or send an email. Do not wait to bring issues, course related or otherwise, to my attention. If you cannot attend office hours, send me an email (preferably through Canvas) to try to make other arrangements.

Tips for Success

- Be proactive about your success in the course.
- Do not procrastinate! Begin your assignments and begin studying early!
- Attend every class meeting.
- Ask questions whether it is during class, recitation, office hours, at the math clinic or via email to your instructor.
- Form a study group! Working together will help you and others better understand the course material as you can work through different difficulties and offer each other clarifications on concepts.
- Do problems! Reading through your notes is not enough. Seek out new problems and work through them carefully. When you are done, check your answer. If you are wrong, examine carefully what misunderstanding occurred and how to avoid it in the future.
- Every time you approach a new concept, carefully think how it could be applied in your own field of study.

Special Needs

If you believe that you may need an accommodation based on the impact of a disability, please contact Disability Resources as early in the semester as possible, in order to discuss your specific needs and to determine a reasonable accommodation plan. You may contact Disability Resources Office in Bertolini Student Center, 3rd Floor (disabilityinfo@santarosa.edu, phone: 707-527-4278).

Academic Honesty

Academic honesty and integrity is expected at all times. Cheating will not be tolerated.Cheating includes plagiarism of any sort, as well as receiving or providing unauthorized assistance on any type of assignment. Minimum consequences for cheating will be a grade of zero for the assignment or exam with possible consequences of an F in the course or expulsion from school. Furthermore, any incidence of cheating will result in a note of explanation being placed in your disciplinary file. Please carefully read the full policy on academic integrity in the Santa Rosa Junior College catalog. All course materials for Santa Rosa Junior College courses are the exclusive property of the individual(s) who created them. It is illegal to share or sell any course materials you may obtain as a student in this class, whether on paper or in digital form. Unauthorized reproduction and distribution of SRJC course materials may be grounds for disciplinary and/or legal action.

Student Conduct

We will conduct ourselves in a manner which reflects our awareness of common standards of decency and the rights of others. All students are expected to know the Student Conduct Policy and adhere to it in this class. Students who violate the code may be suspended from 2 classes and may be referred to the Conduct Dean for discipline.

Remote Learning Etiquette & Expectations

- Stay focused. Please stay engaged in class activities. Close any apps on your device that are not relevant and turn off notifications.
- Turn on your video when possible. It is helpful to be able to see each other, just as in an in-person class.

  **Exceptions: If you have limited internet bandwidth or no webcam, it is ok to not use video. If you're unable to find an environment without a lot of visual distractions, it is also ok to turn off your video.*
- Keep it clean. Don't share anything you wouldn't put up on the projector in class!
- Mute your microphone when you are not talking. This helps eliminate background noise.
- Use a headset when possible. If you own headphones with a microphone, please use them. This improves audio quality.
- Be in a quiet place when possible. Find a quiet, distraction-free spot to log in. Turn off any music, videos, etc. in the background.
- Stay on topic. Use the chat window for questions and comments that are relevant to class. The chat window is not a place for socializing or posting comments that distract from the course activities. If you fill it up with random comments, I will be unable to sort through the information quickly to address students' real questions/concerns about the course.
- No disrespect or hate speech. Just like in our in-person class, respectful behavior is expected. Consider Zoom a professional environment, and act like you're at a job interview, even when you're typing in the chat