Course Syllabus

Math 5 Fall 2022 Section 1079

Introduction to Linear Algebra

Class Meetings

Meets Tuesday and Thursday, 7:00 AM - 9:00 AM in 204 Kunde

Instructor Contact Information

Instructor: Sara Jones

email : sjones@santarosa.edu or sarajones@prodigy.net

Office: 228 Kunde Hall, 707- 527- 4296, Cell 707 - 758- 0084,

Personal Zoom Meeting ID: 601 020 9598

I have regular office hours and Zoom student help hours. Feel free to drop in any time to say hi or ask a question. I always like to see students! I would appreciate it if you let me know you are coming. If these times don't work, email me and we will find a time that does.

Student Help Hours:

Monday, Wednesday 9:15 - 9:50 AM Bussman 1454
Tuesday and Thursday 9:00 - 9:50 AM Kunde 204
and by appointment in person or on Zoom. Always send an email prior to attending a zoom office hour.

Please check your Canvas account and your SRJC email daily for any announcements, handouts or assignments that I may send out. Check settings to be sure that the email in Canvas and your Cubby is one that you check regularly. It is okay to ask in class if you are unsure when an assignment is due.

If you email me, please include your full name as well as the course name, Math 5.

Math 5 Course Description

Catalog Description:

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

Student Learning Outcomes:

Upon completion of the course, students will be able to:

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

Course Outline and Student Learning Outcomes:

Sustainability Course

This Course will be included as class examples, homework problems, and projects. Sustainability issues will be integrated into the learning of calculus to help enlighten, engage and motivate students to pursue sustainability in their future careers and engage in personal activities that will positively affect the environment in which we live.

Required Materials

A Computer

A computer with consistent internet access. Laptops will be distributed by the SRJC Libraries to the general student population on a first-come, first-served basis using the materials request process. For instructions on how to request a laptop click here. All students will be notified through email when the application process is open and how to apply.

Canvas Course WebSite

Students will use the Canvas course website for finding due dates, assignment instructions, submitting assignments, viewing classmate's work, sharing resources, and viewing grades. Download a Scanner to create PDFs on your phone similar to GeniusScan or CamScanner

MyLab and Mastering

- Use Canvas Course to enter MyLab and Mastering. Purchased Access code for MyMathLab from directly from Pearson. The content is delivered electronically after each student places an order online.
- Access to the eBook, Introduction to Linear Algebra 6th Edition by Lay is available in MLM
- Create an account at Sage Math Cloud, link: https://cloud.sagemath.com/
- Your final write up for your Labs needs to be completed in \LaTeX with proper mathematical typesetting and proper writing style, and you need to upload the final pdf version of the lab on Canvas. Click on the following link for a short introduction to \LaTeX\ using Sage Math cloud: https://www.youtube.com/watch?v=pIKtmmJe6YM}{https://www.youtube.com/watch?v=pIKtmmJe6YM

A Graphing Calculator:

TI-84 or TI-89. The Library has calculators to borrow for the semester for free but they run out so get yours now!

Assignments

Computer Homework

- You will find the computer homework problems in Canvas in the MyLab and Mastering Assignments.
- Do all of the problems given in each assignment.
- You should state a summary of the problem, write complete sentences that will help you review later and show all work.
- Written Computer Homework will be due with your refrigerator homework at the start of class.
- Hand write the percentage correct on the top.
- You may finish and correct your work after class, but 20% will be deducted from the score of any portion that is late.
- Example problems and videos are available in MLM. Use these sparingly. If you need help from MLM, an answer key or the internet to solve a problem, always do a similar problem the next day without the help.

Refrigerator Homework

- Refrigerator Homework will be due with your computer homework at the start of class.
- Plan to arrive at class and put the solutions to the RH problems on the board so we can discuss them during our homework review at the start of class.
- Each refrigerator homework assignment is worth 10 points. 2 points for submitting the final draft in class including the handwritten work for the Computer Homework and 8 points for the correctness of the refrigerator homework.
- Refrigerator homework problems are done from the eBook text. You can find the eBook in MLM.
- Work should be done neatly, answers boxed, with a line and space left for comments between problems, in two columns.
- Refrigerator Homework(RH) should be so complete, beautiful, and so clear that it is suitable for display on your refrigerator.
- In cases of illness or emergency, late RH will be accepted but will be worth 8/10.
- Do the homework on time. It is very hard to understand a lecture and get caught up if you get behind.

Projects

We will have 4 Lab projects giving some applications of Linear Algebra and introductions to Sage and LaTex.

Quizzes

Some quizzes are in class and other quizzes will be completed at home with some class time. You are responsible for completing every quiz. If you submit a take home Quiz for Peer Review in Canvas ½ hour before class you can view others quizzes and collaborate on solutions. We will go over, correct, and turn in quizzes during class. A late quiz or quiz on which you receive less than half credit may be corrected and resubmitted within a week to get up to 80% credit.

Group Quiz Process

1. Start work on Quiz as soon as you receive it in class or on Canvas.
2. You may ask me or classmates for hints. You may not copy work from classmates or the internet.
3. If available, turn as much of the quiz as you can complete in the Canvas Assignment Quiz. When you do, you will get peer reviews. Use these to get ideas for solutions, compare your answers and check your work.
4. Bring quiz and work to class. I will give more hints and let you work with classmates.
5. Submit your quiz at the end of class.
6. If you can't finish in class you can get up to 80% credit by submitting on Canvas later or at the next class meeting**.**

Tests

Test dates are listed below, and cannot be made up. The final is cumulative. Your Grade on the final can replace a missed or low test grade. Test points have more weight than homework points.

You will be taking your tests in person in class with me proctoring. DRD accommodations will be made.

GRADING

If you want to pass, come to class, do every assignment, and see me if you need help!!

Assignment Category	% of grade
Tests (3 at 14% each)	42%
Computer Homework	7%
Refrigerator Homework	7%
Quizzes	7%
Projects	7%
Final Exam	30%
Total	100%

Course grades use the following scale:

A: 90-100 **B**: 80-89 **C:** 70-79 **D:** 60-69 **F:** 0-59

Example: Mr. Bill has scores of 65, 70, and 75 on his three tests and his final exam score is 70. These scores determine most of his grade because the proportions are higher. His refrigerator homework average is 567/600 = 94.5%, his computer homework average is 91% and his quiz average is 90%, and the score on the project is 80/100 =80%. His course grade is then

0.14*(65 + 70 + 75) + 0.30*70 + 0.07*94.5 + 0.07*91 + 0.07*90 +.07*80 = 75.3, a C in the class. Students do better on the tests and final when they work to digest the material while doing the homework, quizzes and projects. Copying answers on these assignments does not produce the same learning and understanding that comes with struggling to complete the assignments on your own.

Students with Disabilities:

If you need disability related accommodations for this class, such as a note-taker, test-taking services, special furniture, or anything else, Please email me the Authorization for Academic Accommodations (AAA letter) from the Disability Resources Department (DRD) as soon as possible. You may also speak with me privately during office hours about your accommodations. If you have not received authorization from DRD, it is recommended that you contact them directly. DRD is located on the Third Floor in the

Bertolini Student Center, room 4844. You can find more information at https://drd.santarosa.edu/ or 707-527-4278.

Classroom Norms and Student Success

Diversity

"Diversity, Equity, and Inclusion Statement: People of diverse backgrounds, perspectives, socioeconomic levels, cultures, and abilities are valued, welcomed, and included in this class!"

"In this class, we promote acceptance of all people, including those of diverse age, ancestry, color, disability, ethnicity, perspective, national origin, religion, gender, gender identity, sexual orientation, education, or socioeconomic status."

"It is extremely important that ALL students feel comfortable in this class. We want to create a relaxed and confident environment and get to know each other. This means treating each other with mutual respect, being professional, and withholding opinions that may be judgmental. This will help everyone enjoy our class."

Assistance

In addition to my office hours, you have the following available to you:

- Any student who has declared a Calculus based Science Major, you can join MESA, located in Bertolini. They have tutoring services and so much more!
- In Cengage MyMathLab you can find instructional videos, completed example homework problems, and many other useful materials.
- Watch SRJC's Math Lab Welcome and Instruction Video then use the SRJC Math Lab Meeting Request direct link to schedule an appointment.
- The Math Department office has a list of private tutors.
- ***SRJC Tutorial Centers*** can also be accessed through their website:
    - **Drop-In Live Tutoring** - Will connect you with a tutor
    - **Virtual Front Desk** - Will connect you with tutorial center staff available for questions during our hours of operations
    - **NetTutor** - Students needing academic assistance outside of the SRJC Tutorial Center hours, will continue to have access to NetTutor online tutoring 24-7 for unlimited hours.

Dropping the Class

If you decide to discontinue this course, it is your responsibility to officially drop it. A student may be dropped from any class when that student's absences exceed ten percent (10%) of the total hours of class time. It is strongly advised that if you need to miss more than one class/homework deadline in a row that you contact the instructor to avoid being dropped from the class.

Attendance

Students who fail to attend the first class meeting may be dropped by the instructor. Instructors are required to drop all No-Show students immediately following the second class meeting. A No-Show is an enrolled student who has not attended any class meeting of the course or has not completed any of the assignments in the first two weeks. Attendance will be taken at each class meeting so that COVID tracing can be done.

Student Success

- Come to class ready to learn.
- Make sure you eat, sleep and exercise.
- Read the material that will be covered before and after class.
- Always complete homework on time.
- Turn in all homework and quizzes.
- If you miss class, contact me via email immediately to schedule and make up any missed work.
- Do a little homework each day.
- Work for this class will take between 10 and 20 hours outside of class each week. Be sure to schedule time to complete this work at the beginning of the semester.
- Enlist support from employers and loved ones right now.
- Get to know and work with classmates outside of class time.
- Keep a binder containing all classwork and Homework Assignments
- Use a pencil ONLY and erase your mistakes.
- *Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in the course, is urged to contact the Student Resource Centers for support. Furthermore, please notify the professor if you are comfortable doing so.*

Physical and Mental Health

Health issues (physical and mental) can interfere with your academic success. Student Health Services is here to support you. Should you experience any physical or mental health issues, know that all of us at SRJC care about your well-being. SRJC's Student Health Services (SHS) has nurse practitioners and mental health therapists available. Confidential sessions are provided via secure Zoom or in-person. Sessions are free for SRJC students taking credit or non-credit classes, and some providers can converse with you in Spanish if you prefer. SHS also has on-site covid rapid testing and vaccinations available at no cost. To start the process for any type of physical or mental health appointment contact Student Health at 707- 527- 4445 or email studenthealthservices@santarosa.edu. More information about all that Student Health Services provides is available at shs.santarosa.edu.

Classroom Conduct

- Please turn off and put away all phones, pagers, music, etc. upon our entering class.
- If you are caught cheating, you will receive a zero for that test/assignment. You will also be suspended from class for two class meetings and you will not be allowed to make up any missed work. If you are caught cheating there will also be a letter written to the Vice President of Student Services to report the incident. The Vice President may then take additional disciplinary action ranging from reprimand to expulsion.
- The SRJC Rights and Responsibilities for students can be found at the following site: https://studentlife.santarosa.edu/rights-and-responsibilities
- Submitting others' work or copying of tests or assignments in whole or in part will be considered an act of academic dishonesty and result in a grade of 0 for that test or assignment. I encourage

students to collaborate and share information and ideas, but not copy others' work. See these links on Plagiarism:

- SRJC Writing Center Lessons on avoiding plagiarism
- SRJC's policy on Academic Integrity

Homework Hints

- Check odd answers in the back of your book (Appendix of eBook). If you are assigned an even problem and don't know what the answer should include, look at the previous odd answer for the correct form. Solutions to homework problems from the book are available online. You should not copy these solutions and think that you are doing homework. A math student should be able to create and develop the solutions without copying.
- Ask for help before the class in which the assignment is due. I am happy to help.
- Write in complete sentences and equations. Learn the correct notation and symbols as soon as possible.
- Collaborate with a classmate to check answers and work on the problems.
- When solutions are short, draw a line down the middle of the page to form two columns. Circle or box Answers. Draw a line and Leave blank space between problems for corrections and comments.

Participation

Attendance is not marked by your body in a class, but rather by your participation within the class activities.

Here are the brief "guidelines" we will follow to structure participation:

- Check-in and interact in the Canvas course several times a week;
- Attend Lecture;
- Participate in all class quizzes—submit your peer review quiz by uploading in assignments ½ hour before class starts. Comment on your classmate's quizzes. Submit your final draft by 5 PM.
- Homework will be due at the start of class. You are allowed to correct your work before 5 PM without a 2 point late penalty;
- Connect with me beforehand if you are going to be disconnected from the course for more than 5 days.

This course follows a weekly schedule. Each week you will interact with your peers in weekly discussions, and complete a series of activities and assignments. The weekly schedule allows us to learn from one another, and it keeps everyone on a path toward our learning goals.

With each of your assignments, I will provide feedback, which opens another opportunity for revision, learning, and growth. Working within our weekly schedule allows both you and me to plan our time.

The course is designed to take about 8-12 hours per week. Please plan to log in to the course a few times each week—we have regular due dates for discussions and assignments please check Canvas regularly.

Your participation is an important part of the success of this course, but I also recognize that you each have other classes, family and friends to care for, and, because we are human, sometimes we are just swamped or under the weather. If you have reached a point where you can't meet a deadline, please contact me—we will work together to make a path to success.

Netiquette, or Why Is It Harder to Be Polite Online?

Netiquette refers to using common courtesy in online communication. All members of the class are expected to follow netiquette in all course communications. Use these guidelines:

- Use capital letters sparingly. THEY LOOK LIKE SHOUTING.
- Forward emails only with a writer's permission.
- Be considerate of others' feelings and use language carefully.
- Cite all quotations, references, and sources (otherwise, it is plagiarism).
- Use humor carefully. It is hard to "read" tone; sometimes humor can be misread as criticism or personal attack. Feel free to use emoticons like :) for a smiley face to let others know you are being humorous.
- Use complete sentences and standard English grammar to compose posts. Write in proper paragraphs. Review work before submitting it.
- Text speak, such as "ur" for "your" or "ru" for "are you" etc., is only acceptable when texting.

Tentative Class Calendar

Dates to remember

Date	Event
September 15	Test 1
March 21-26	Spring Break
October 20	Test 2
November 13	Last day to drop with a W
December 1	Test 3
December 15	Final

Date	Section to cover	Refrigerator Homework
8/18/2022	1.1 Systems of Equations	1.1 # 23,26,33
8/23/2022	1.2 Row Reductions and Echelon Form	1.2 # 3,7,14,2124,35,37
8/25/2022	1.3 Vector Equations	1.3 # pr3,17,21,23,25,33
8/30/2022	1.4 The Matrix Equations Ax=b	1.4 # 13,15,18,20,23,32,33,43
9/1/2022	1.5 Solution Sets for Linear Systems 1.6 Applications of Linear Systems	1.5 # 5,7,20,23,28,40 1.6 # 1,4,6,7,12
9/6/2022	1.7 Linear Independence	1.7 # 7,9,20,21,23,27,29,36,37,42,44
9/8/2022	1.8 Linear Transformations	1.8 # 17,20,21,24,31,32,39
9/13/2022	1.9 The Matrix of a Linear Transformation	1.9 # 10,17,23,25,33,35,43
9/15/2022	1.10 Linear Models	1.10 # 6,9,12
9/20/2022	Test 1 Chapter 1	

9/22/2022	2.1 Matrix Operations 2.2 The Inverse of a Matrix	2.1 # 9,25,29,31,32,35 2.2 # 10,24,29,30,32
9/27/2022	2.3 Characterizations of Invertible Matrices	2.3 # 15,24,34,42 Lab 1 Vector Transformations
9/29/2022	3.1 Introduction to Determinants	3.1 # 22,36,38
10/4/2022	3.2 Properties of Determinants 3.3 Cramer's Rule and Linear Transformations	3.2 # 5,11,33,40,46 3.3 # 7,14,17
10/6/2022	4.1 Vector Spaces and Subspaces	4.1 # 12,20,39,40
10/11/2022	4.2 Null Spaces and Column Spaces 4.3 Linear Independence	4.2 # 4,12,42,43,45 4.3 # 14,20,32,41,42,44
10/13/2022	4.4 Coordinate Systems	4.4 # 13,27,36
10/13/2022	4.5 Dimension	4.5 # 7,11,30,37,43,51
10/18/2022	4.6 Rank	4.6 # 2,15,17
10/20/2022	Test 2	
10/27/2022	5.1 Eigenvectors and Eigenvalues	5.1 # 6,19,24,27,33
10/27/2022	5.2 The Characteristic Equations	5.2 # 9,17,18,25
11/1/2022	5.3 Diagonalization 5.4 Eigenvectors and Linear Transformations	5.3 # 5,18,21,23,24 5.4 # 4,5,9,15,26,34
11/3/2022	5.5 Complex Eigenvalues 5.6 Discrete Dynamical Systems	5.5 # 5,9,18,28, 5.6 # 2,5,8,12,17,18 Lab 2 Sea Turtles
11/8/2022	5.9 Markov Chains	5.9 # 4,5,14,27 Lab 3 Coffee Cups
11/10/2022	PDA Day	
11/15/2022	6.1 Inner Product Spaces	6.1 # 19,24,29,30,32,37,39
11/17/2022	6.2 Orthogonal Sets	6.2 # 23,25,26,32,33,34,40
11/22/2022	6.3 Orthogonal Projections	6.3 # 7,12,16,17,21
11/24/2022	Thanksgiving Break	
11/29/2022	6.4 The Gram Schmidt Process	6.4 # 11,15,17,18
12/1/2022	Test 3	
12/6/2022	6.5 Least-Squares Problems	6.5 # 6,12,27
12/8/2022	6.6 Machine Learning and Linear Models	6.6 # 2,6,14,17
12/8/2022	6.7 Inner Product Spaces	6.7 # 9, Lab 4 Linear Regression
12/13/2022	Final 7- 10 AM	