# MATH 9— FINITE MATHEMATICS —FALL SEMESTER 2021
# Section 1085, Doyle 146, 1:30pm-3:00pm MW, 3 Units

***Instructor***: **Mark Ferguson**. Office: Kunde Hall, Room 211. Email: ***mferguson@santarosa.edu***

***Important Notes:***

- Office Hours: asynchronous and by appointment
- Canvas will not be used.
- Email will be checked on normal class days.
- Give yourself the best chance of succeeding by:
    - Meeting the prerequisites
    - Providing a good-faith effort
    - Communicating often and taking the time to formulate good questions
    - Having patience
    - Exhibiting academic integrity
    - "Visiting" Office Hours
    - Striving to be "impossible to be misunderstood"
    - Realizing that your work will be graded in accordance with a college-level, STEM-based class

***Also:***

- Our classroom is a place reserved for learning. Being kind, open-minded, respectful, patient, and tolerant are qualities conducive to learning. It is expected that you will be prepared to learn and exhibit these behaviors.
- It is critical that students work on homework frequently throughout the semester.
- No active (ear, cell, smart) phones or computers are allowed during class. Please turn them off and put them away.
- This syllabus is intended to give the student guidance to what/how/when topics will be covered and assessed during the semester and will be followed as closely as possible. However, I reserve the right to modify, supplement, or make changes to the syllabus as needed. Continued registration in this course means that you agree to the policies and procedures outlined in this syllabus.
- Students are expected to frequently use technology to explore mathematics throughout our course; therefore, a graphing calculator is required. You are welcome to choose any that works sufficiently for our course, however TI graphing calculators will likely be used in class. Graphing calculators will not be used in traditional testing settings. Let me know if you have questions regarding technology.
- Students are required to have a text for our course. Our text is available nowadays in many different forms; e.g., as a traditional textbook, in electronic format, etc. You are welcome to choose the one that works best for you; you may have a preference or there may be cost savings with one format versus another.
- I will be teaching the course with the 14$^{th}$ edition of our textbook. If you choose an earlier/different version, it is up to you to reconcile the differences between editions.

***Academic Integrity***—All written work is to be original; plagiarism of any kind will result in a failing grade on that assignment. Students who plagiarize or cheat may be suspended [for one or two class meetings] and referred to the Vice President of Student Services for discipline, in cases of egregious violation.

***Attendance***—Attending class greatly increases the likelihood of success in our course, however I believe that adult college students know this (or, are learning this), and will make their own choice regarding attendance. There are no points associated with attendance. I am required to follow College Policy regarding attendance: A student may be dropped from any course when that student's absences exceed ten percent (10% constitutes an "excessive" number of absences for this course) of the total hours of class time. Students who fail to attend the first class meeting may be dropped from the course. Students who enroll in the course and do not attend the first two class meetings are declared "No-Show" and will be dropped from the course.

## *Course Description*

**Finite Mathematics:** Sets, matrices, systems of equations and inequalities, linear programming, combinatorial techniques and probability, mathematics of finance, Markov chains, game theory.

## *Course Outline of Record*

**This is available online:** go to the SRJC homepage and search for MATH 9 under the course outlines link.

## *Prerequisites, Required and Optional Materials*

**Prerequisite:** Successful completion of MATH 156, Intermediate Algebra, or equivalent.

**Required Materials:** The textbook (below) and a graphing calculator/access to a CAS.

**TEXT:** Finite Mathematics for Business, Economics, Life Sciences and Social Sciences, 14th Edition by Barnett, Raymond; Ziegler, Michael; Byleen, Karl; and Stocker, Christopher J., Pearson Publishing, 2019.

***Study Guides/Student Solutions Guides are helpful to many, but are optional***

***Our text is on reserve at the Doyle Library at the Reserve Desk (if it's open). Bring your SRJC ID to check out the text.**

## *Class Structure/Content*

- We will cover topics (roughly) from chapters 2-9 (see Ideal Schedule for details—there are many chapters where only a few sections are covered) and section 11.1. With a few exceptions, we will cover one section per day.
- My goal is to have a typical day in class go as follows: We will discuss a new topic for a while, and then, time permitting, work on some exercises together. We'll take a break and then do the same thing for the remaining time. You will likely need a pencil and paper every day in class. You are expected to work on homework outside of class almost every day—as often as you need—in order to succeed in the class. Your success depends greatly on the amount of work that you put into the class.
- The quizzes, exams and final will be comprised of topics we discuss in class AND the assigned homework so, PLEASE COME TO CLASS AND KEEP UP WITH THE HOMEWORK (including readings).

## *Activities & Points—Keep Track of Your Grade*

| Activity | Points Possible | Your Points | Your Cumulative Points | Cumulative Points Possible | Your Cumulative Percentage |
|---|---|---|---|---|---|
| HW Quiz 1 Monday of Week 5 | 50 | | | 50 | |
| Exam 1 Monday of Week 7 | 100 | | | 150 | |
| HW Quiz 2 Monday of Week 11 | 50 | | | 200 | |
| Exam 2 Monday of Week 13 | 100 | | | 300 | |
| HW Quiz 3 Monday of Week 16 | 50 | | | 350 | |
| Take Out Lowest Quiz Score | -50 | | | 300 | |
| Final Exam on Wednesday, Dec 15, 1:00pm-3:45pm | 150 | | | 450 | |

## *Activity Details*

**Homework Quizzes (Three at 50 points each; only two count toward your grade)**
These quizzes will be held in class. You will only be allowed to use completed homework on this quiz. Only your top two quiz scores will be counted toward your grade. 80% of the points on each quiz are related to assigned homework. No quiz make-ups are available. Quizzes are usually returned, graded, no later than one week of the quiz date. Students are asked to review their graded quizzes and wait at least 48 hours to discuss questions and ask for further feedback on graded quizzes.

**Exams (Two at 100 points each)**
These will be taken in our classroom on **Monday** of week 7 and week 13. You will be notified of the exam topics and the materials you can use on the exams prior to each exam. These exams may only be taken at a different time with advanced notice and must be taken prior to the original scheduled date. Exams are usually graded and returned no later than one week of the exam date. Students are asked to review their graded exams and wait at least 48 hours to discuss questions and ask for further feedback on graded exams.

**Final Exam (150 points)**
Be prepared for a mostly cumulative final exam. It will be written to take about 2.5 hours and will be given at the College-designated time. You will be notified of the exam topics and the materials you can use on the final prior to the final. The final can only be taken at a different time with advanced notice and must be taken prior to the original scheduled date. Final exams are not returned to the students; however, you are welcome to come by during the following semester to review your final exam.

## *Grading Policy*

**Graded exams may be discussed at least 48 hours after they have been returned to you. Letter grades will be assigned on a scale no stricter than the following:**

| Letter Grade | Percentage |
|---|---|
| A | 90 to 100 |
| B | 80 to 89 |
| C | 70 to 79 |
| D | 60 to 69 |
| F | 0 to 59 |

***Tutoring***
Provided by the SRJC Math Lab; Link: https://mathematics.santarosa.edu/online-math-lab-tutoring

***Accommodations for Students with Disabilities***—If you need disability related accommodations for this class, such as a note taker, test taking services, special furniture, etc., please provide the Authorization for Academic Accommodations (AAA letter) from the Disability Resources Department (DRD) to me 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 in the Bertolini Student Center, Third Floor, Room 4844 on the Santa Rosa campus. Also, DRD's link: https://drd.santarosa.edu

## *Ideal Schedule and List of Text Homework Exercises*

(Note that the ideal schedule is just that—ideal. Our actual pace may cause us to run a little behind or ahead of the ideal schedule throughout the semester… hopefully we stay ahead more often than behind!)

| Week Number | Date (Week Beginning Monday…) | Section Number and Title from Our Text Read these sections before they are covered (quiz/exam notes as well) | Homework Exercises—Work these exercises after we've covered the section in class |
|---|---|---|---|
| 1 | August 16 | 2.1: Functions<br>2.5: Exponential Functions<br>2.6: Logarithmic Functions | 2.1: 1-89 odd<br>2.5: 1-65 odd<br>2.6: 1-91 odd |
| 2 | August 23 | 3.1: Simple Interest<br>3.2: Compound and Continuous Compound Interest | 3.1: 1-67 odd<br>3.2: 1-79 odd |
| 3 | August 30 | 3.3: Future Value of an Annuity; Sinking Funds<br>3.4: Present Value of an Annuity; Amortization | 3.3: 1-45 odd<br>3.4: 1-53 odd |
| 4 | September 6 | Monday No Classes—Labor Day Holiday<br>4.1: Review: Systems of Linear Equations in Two Variables | 4.1: 1-79 odd |
| 5 | September 13 | Monday— HW Quiz 1<br>4.2: Systems of Linear Equations and Augmented Matrices | 4.2: 1-61 odd |
| 6 | September 20 | 4.3: Gauss-Jordan Elimination<br>4.4: Matrices: Basic Operations | 4.3: 1-89 odd<br>4.4: 1-71 odd |
| 7 | September 27 | Monday—Exam 1<br>4.5: Inverse of a Square Matrix | 4.5: 1-85 odd |
| 8 | October 4 | 5.1: Linear Inequalities in Two Variables<br>5.2: Systems of Linear Inequalities in Two Variables | 5.1: 1-55 odd<br>5.2: 1-51 odd |
| 9 | October 11 | 5.3: Linear Programming in Two Dimensions: A Geometric Approach<br>6.1: The Table Method: An Introduction to the Simplex Method | 5.3: 1-35 odd, 49, 51<br>6.1: 1-27 odd |

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|---|---|---|---|
| **10** | October 18 | 6.2: The Simplex Method: Maximization with Problem Constraints of the form ≤<br>7.2: Sets | 6.2: 1-25 odd, 41<br>7.2: 1-85 odd |
| **11** | October 25 | Monday— HW Quiz 2<br>7.3: Basic Counting Principles | 7.3: 1-57 odd |
| **12** | November 1 | 7.4: Permutations and Combinations<br>8.1: Sample Spaces, Events, and Probability | 7.4: 1-55 odd<br>8.1: 1-81 odd |
| **13** | November 8 | Monday Exam 2<br>Wed. & Thurs. No Classes—Vet's Day Holiday | |
| **14** | November 15 | 8.2: Union, Intersection, and Complement of Events; Odds<br>8.3: Conditional Probability, Intersection, and Independence | 8.2: 1-71 odd<br>8.3: 1-61 odd |
| **15** | November 22 | Thurs. No Classes--Thanksgiving<br>8.5: Random Variable, Probability Distribution, and Expected Value<br>10.4: Bernoulli Trials and Binomial Distributions | 8.5: 1-41 odd<br>10.4: 1-45 odd |
| **16** | November 29 | Monday— HW Quiz 3<br>9.1: Properties of Markov Chains | 9.1: 1-89 odd |
| **17** | December 6 | 9.2: Regular Markov Chains<br>11.1: Strictly Determined Games | 9.2: 1-43 odd<br>11.1: 1-45 odd |
| **Finals** | December 13 | Final Wednesday, Dec. 15, 1:00 pm - 3:45 pm | |