

Math 109—Mathematics for the Social & Management Sciences

The study systems of linear equations, matrices, linear programming, exponential growth and decay, mathematics of finance, and differential calculus with emphasis on applications. **4 credits**

Instructor: Gretchen Renfert	Office Hours	Course Meeting Times		
Office: B348 SCI email: grenfert@uwsp.edu	TU, WE, TH 1 – 1:45 PM or by appointment	<u>Sec</u>	<u>Time</u>	<u>Room</u>
		2	10 AM MTWR	A210 SCI
		1	11 AM MTWR	A208 SCI

Text (rental): *Mathematical Applications for the Management, Life and Social Sciences*, 12th Ed., by Harshbarger & Reynolds (Published by Cengage) ISBN: 978-1-337-62534-0
Topics include most of those in Chapters 1–3, 5-6, and 9-11, but not in that order.

Calculators: You will need a scientific calculator during parts of the semester, preferably a model with at least a two-line display. (The TI-30XS and Casio Fx115 are two popular models)
* A **graphing calculator** or **graphing app** will be necessary for the final unit. I will show you several apps that are either free or under \$5 that you can use instead of a graphing calculator if you do not have access to one.

Do not become too dependent on using calculators or technology--one of the goals of this course is for you to be able to predict how a change in variable, exponent, or coefficient effects the behavior of a function. Often the subtle changes are not visible in the graph displayed on a graphing calculator or graphing app unless you know where to look for the significant features of the graph.

Prerequisites: Math 107, Math 100, or a suitable placement test score.

Quantitative Literacy Learning Outcomes: Students will develop the following communication skills, and problem-solving approaches to applied problems in fields such as business, economics, life sciences and social sciences:

- 1) Select, analyze, and interpret appropriate numerical data used in everyday life in numerical and graphical format
- 2) Identify and apply appropriate strategies of quantitative problem solving in theoretical and practical applications.
- 3) Construct a conclusion using quantitative justification.

Evaluation: Final course grades will be determined by the following:

20 % for Quizzes	(see the last page for approximate Quiz dates)
20 % for Exam 1	Thursday, February 24
20 % for Exam 2	Wednesday, March 16
20% for Exam 3	Thursday, May 5
<u>20%</u> for the Comprehensive Final Exam on	Monday, May 16, 5:00 – 7:00 PM
100%	(CCC 321)

Course Grades (%) at or above	93	90	87	83	80	77	73	70	67	60
will receive at least a grade of	A	A -	B +	B	B -	C +	C	C -	D +	D

* I reserve the right to exercise discretion in raising a student's grade if the final weighted average does not appear to reflect the quality of a student's work (for example: one low exam score in the course causes the weighted average grade to appear lower than the student's overall work).

CANVAS Homework solutions, occasional handouts, grade information, and other class announcements can be found on CANVAS. Some videos will be posted in CANVAS if class is unable to meet.

Cell Phones should be silenced and put away once class begins.

Food/Beverage: I would prefer that you not eat in class.

Homework: Almost every day a *minimal* list of problems which you need to understand in order to do well in this course will be given in class. The homework will not be graded, but it is highly recommended that you practice doing problems. The first 5 minutes of each class day will be reserved for addressing homework questions or concerns. Do not be afraid to ask—your questions help me determine how the class is doing.

**** I post my worked-out solutions to the homework to help if you get stuck. ****

Attendance is expected at every class meeting. If you become ill, I expect you to make a reasonable effort to keep up with what was taught by checking CANVAS, following in your book, and making every attempt to do the homework. If a serious illness or emergency cause you to miss class on the day of a Quiz or Exam, it is necessary that you inform me as soon as possible of your situation. No graded Quizzes or Exams will be returned to students until it is determined if and when absent students be allowed to make up the Quiz or Exam.

**** Missing class on the day of a Quiz or Exam could likely result in a score of zero! ****

If there are extenuating circumstances, let me know as soon as possible.

Quizzes are worth 20 points each and should take no more than 15-20 minutes. Quizzes will usually occur at the end of the class period, after a short lesson has been taught. Quizzes give you an opportunity to get feedback on your work for the types of questions I deem important. There are no retakes allowed on Quizzes.

Exams are worth 100 points and will take the entire class period. You may not have extra time to complete an exam unless you have applied for and been granted accommodations through the DATC office (see procedure below). There are no retakes allowed on Exams.

Incompletes: A course grade of “Incomplete” may be given if circumstances arise which are beyond the student’s control and the student is unable to complete the course. However, the student must have had a passing grade in the course when the circumstances arose. A written agreement between instructor and student must be completed and filed with the Dean’s Office detailing the amount of work that must be completed and the agreed upon deadlines.

Disability Accommodations: Reasonable accommodations are available for students who have a documented disability. For information on accommodations available to students with disabilities, visit the Disability and Assistive Technology Center website: <https://www.uwsp.edu/datc/Pages/default.aspx>

3 Steps to Apply for Accommodations:

The following steps do not necessarily need to be completed in order. Students wanting to meet to discuss potential accommodations can schedule a consult at any time.

1. Establish a DATC Connect Account
2. Submit Documentation
3. Participate in a New Client Intake Meeting

All students are expected to know the UWSP Community **Rights & Responsibilities** and the **Student Academic Standards and Disciplinary Procedures** found on the Dean of Students webpage at <https://www.uwsp.edu/dos/Pages/Student-Conduct.aspx>

The Key to Success in this class:

1. Attend class
2. Do the homework
3. Ask Questions
4. Use Office Hours and/or Tutoring Services to get additional help

STEM Tutoring

The STEM Tutoring Program on the Stevens Point campus is offering FREE tutoring during Spring 2022. These services are available to students from all three campuses.

- The **STEM Drop-In Tutoring Center in CBB 190** opens on **Monday, January 31**. Students do not need to make an appointment or register in advance; they can simply "drop-in" when there are tutors available for their class. The drop-in schedule can be found [here](#) and will be posted by the 1st week of class. Please note that we are not able to offer this service virtually.
- **STEM One-on-One Tutoring** begins on **Monday, January 31**. Students can sign up to meet with a tutor on a weekly, recurring basis by completing the online request form located [here](#). Appointments are made based upon tutor availability – we cannot guarantee that every student will be matched with a tutor. Students may request in-person or virtual appointments, but availability of virtual appointments may be limited.

The tutors are UWSP students who have done well in their classes and who are here to share their successful study habits and content knowledge to help others succeed. Discussing concepts and practicing problems together clarifies and solidifies knowledge, and the tutors are eager to study with you.

If you have questions about the schedules or would like to make an appointment, please visit us in ALB 018 (library basement), email (tlctutor@uwsp.edu), or call (715) 346-3568.

STEM Tutoring – Spring 2022

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What	Location	Schedule	Cost
STEM Drop-In Tutoring	CBB 190	No appointment needed – stop by when tutors are available: https://www.uwsp.edu/tlc/Pages/dropInTutoring.aspx	Free
STEM One-on-One Tutoring	ALB 018 or Virtual*	By appointment. Complete online request form here: https://www.uwsp.edu/tlc/Pages/Mathandscischedules.aspx	Free

* Availability of virtual tutoring appointments may be limited

G. Renfert --- Spring 2022					
	Monday	Tuesday	Wednesday	Thursday	* Friday
8:00 - 8:50					
9:00 - 9:50					
10:00 - 10:50	Math 109.2 SCI A210	Math 109.2 SCI A210	Math 109.2 SCI A210	Math 109.2 SCI A210	
11:00 - 11:50	Math 109.1 SCI A208	Math 109.1 SCI A208	Math 109.1 SCI A208	Math 109.1 SCI A208	
12:00 - 12:50	<i>Lunch</i>				
1:00 - 1:50		Office Hour	Office Hour	Office Hour	
2:00 - 2:50	Math 118.1 SCI A207	Math 118.1 SCI A207	Math 118.1 SCI A207	Math 118.1 SCI A207	
3:00 - 3:50					

Week	Dates	Sections	Topic
1	January 24 - 27	Intro & 0.3 0.4 1.2 1.3	Course Intro & Integral Exponents Radicals and Rational Exponents Functions Linear Functions
2	January 31- February 3	1.6 2.1 2.2 2.3 & Quiz 1	Apps of Functions in Business & Economics Quadratic Equations Quadratic Functions Business Applications and Quiz 1
3	February 7 - 10	2.4 Appendix A 9.1 9.1 (and 0.6)	The Special Functions Using a Graphing Calculator or Graphing App Limits: Graphically Limits: Algebraically (and Factoring Review)
4	February 14 - 17	9.3 9.3 9.4 9.8 & Quiz 2	Average Rate of Change Instantaneous Rate of Change: The Derivative Derivative Formulas (shortcuts) Higher Order Derivatives and Quiz 2
5	February 21 – 24	9.5 9.5 9.6 Exam 1	The Product Rule The Quotient Rule The Chain Rule Thursday, February 24
6	February 28 - March 3	9.6 5.1 & 11.2 5.2 & 11.1	The Chain Rule (continued) Derivative of Exponential Functions Derivative of Logarithmic Functions (2 days)
7	March 7 - 10	10.1 10.2 Quiz 3	1st Derivative and Graphs 2nd Derivative and Graphs Quiz 3
8	March 14 - 17	10.3 Review Exam 2	Absolute Extrema Review for Exam 2 Wednesday, March 16
9	March 28 – April 1	10.3 10.4 10.4	Optimization: Business & Economics Applications of Max and Mins More Applications of Max & Min
10	April 4 - 8	6.1 6.2 6.3 6.4	Simple Interest Compound Interest Future Value Present Value
11	April 11 - 15	6.5 Quiz 4	Loans and Amortization Rate of Return Quiz 4
12	April 18 - 21	3.1 3.2 3.3 3.3 3.3	Introduction to Matrices Matrix Multiplication Gauss-Jordan Elimination Matrix Application Problems (with no solution) Matrix App Problems (w/ multiple solutions)
13	April 25 - 28	4.1 4.2 and Quiz 5	Linear Inequalities in Two Variables Linear Programming: Graphical Models & Quiz 5
14	May 2 - 5	Exam 3	More Linear Programming Applications Thursday, May 5
15	May 9 - 13	Review Ch 3-6	In-class review for Final Exam
	Monday, May 16	5:00 - 7:00 PM	Final Exam, ** CCC 321 **

