Math 109—Mathematics for the Social & Management Sciences

The study of 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	M, Th 1:00 - 1:50 PM T, W 2:00 - 2:50 PM or *by appointment*		Sec Time Room 2 **3 PM** MTWR A208 SCI 3 **4 PM** 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, but you do not need to purchase your own graphing calculator. There are 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 <u>be able to predict</u> 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:

10 % for **Unannounced Quizzes**	approximately one per week
10 % for **Announced Quizzes**	(see the last page for "Announced" Quiz dates)
20 % for **Exam 1**	**Thursday,** **February 22**
20 % for **Exam 2**	**Wednesday,** **March 13** (*Spring Break begins 3/16)
20% for **Exam 3**	**Thursday,** **May 2**
20% for **Final Exam**	**Monday,** **May 13, 2:45 PM – 4:45 PM**
100%	

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).

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

CANVAS   Homework solutions, occasional handouts, grade information, and other class announcements can be found on CANVAS. Some videos will occasionally be posted in CANVAS.

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 these 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 determine how class proceeds.
** I post my worked-out solutions to the homework to help if you get stuck.**

Attendance is expected at every class meeting. Attend class regularly and keep up if you must miss class. How? By checking the daily post in CANVAS, following in your book, and doing the homework.
** Missing class on the day of a Quiz or Exam could likely result in a score of zero! **
If there are extenuating circumstances, email me as soon as possible.

No graded Quizzes or Exams will be returned to students until it is determined
if and when absent students will be allowed to make up the Quiz or Exam.

Quizzes: *Announced* quizzes worth 20 points will occur at the end of the class period, after a short lesson. These quizzes take no more than 15-20 minutes and are noted on the tentative schedule (see page 4). Short *Unannounced* ("Pop") Quizzes will be given once per week, taking no more than 5 minutes.
* Pop Quizzes cannot be made up, but midway through the semester, the "Drop Lowest" feature in the gradebook will be turned on to drop several of your lowest Pop Quiz scores.
There are no retakes allowed on Quizzes.

Exams are worth 100 points and will take the entire class period. You must complete the exam by the end of the class period. If you have applied for and been granted accommodations through the DRC office (see procedure below), you will most likely take the exam in an alternate setting.
There are no retakes allowed on Exams.

Incompletes: A course grade of "Incomplete" may be given if circumstances arise which are beyond your control which prevent you from completing the course. To qualify for an incomplete, you 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 Resource Center (DRC)website: https://www.uwsp.edu/disability-resource-center/

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 DRC 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 Tutoring-Learning Center== (TLC) helps students in all disciplines become more effective, confident learners. We believe all learners benefit from sharing work with knowledgeable, attentive tutors. The TLC offers four service areas:

- Academic Coaching: Build skills in studying, time management, test-taking, online learning, and more by working with a peer or professional coach.
- Course Content Tutoring: Practice problems, deepen understanding, and prepare for exams in natural resources, STEM, world languages, and more.
- Reading/Writing: Brainstorm and refine papers, essays, lab reports, citations, résumés, scholarship applications, personal writing, and more using tutoring in-person or through our Online Writing Lab.
- Tech Essentials: Develop computer literacy and learn to use UWSP-related applications such as Canvas, Microsoft 365, and Zoom.

All tutoring services are ==free to UWSP students==. There are two ways to meet with our tutors:

1. Make a One-on-One Appointment: Students can self-schedule using Navigate, contact us at tlctutor@uwsp.edu or 715-346-3568, or stop into CCC 234.
   - On the Wausau campus, contact wautlc@uwsp.edu or 715-261-6148.
   - On the Marshfield campus, contact roleary@uwsp.edu or 715-389-6530.

2. Visit a Drop-In Tutoring Center: No appointment needed! Students can view our Drop-In Tutoring Schedules page to see our availability.

STEM Tutoring – Spring 2024

What	Location	Schedule	Cost
STEM Drop-In Tutoring	**CBB 190**	No appointment needed – Students can view the Drop-In Tutoring Schedules page to see tutor availability.	Free
STEM One-on-One Tutoring	**CCC 234**	Students can self-schedule using Navigate, contact us at tlctutor@uwsp.edu or 715-346-3568, or stop into CCC 234.	Free

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	Monday	Tuesday	Wednesday	Thursday	Friday
8:00 - 8:50					
9:00 - 9:50					
10:00 - 10:50					
11:00 - 11:50					
12:00 - 12:50					
1:00 - 1:50	Office Hour			Office Hour	
2:00 - 2:50		Office Hour	Office Hour		
3:00 - 3:50	Math 109.2 SCI A208	Math 109.2 SCI A208	Math 109.2 SCI A208	Math 109.2 SCI A208	
4:00 - 4:50	Math 109.3 SCI A208	Math 109.3 SCI A208	Math 109.3 SCI A208	Math 109.3 SCI A208	

or by appointment

Tentative Math 109 Schedule   Spring 2024

Week	Dates	Sections	Topic
1	January 22 - 25	Intro & 0.3	Course Intro & Integral Exponents
		0.4	Radicals and Rational Exponents
		1.2	Functions
		1.3	Linear Functions
2	January 29- February 1	1.6	Apps of Functions in Business & Economics
		2.1	Quadratic Equations
		2.2	Quadratic Functions
		2.3 & Quiz 1	Business Applications and Quiz 1
3	February 5 - 9	2.4	The Special Functions
		Appendix A	Using a Graphing Calculator or Graphing App
		9.1	Limits: Graphically
		9.1 (and 0.6)	Limits: Algebraically (and Factoring Review)
4	February 12 - 15	9.3	Average Rate of Change
		9.3	Instantaneous Rate of Change: The Derivative
		9.4	Derivative Formulas (shortcuts)
		9.8	Higher Order Derivatives and Quiz 2
5	February 19 – 22	9.5	The Product Rule
		9.5	The Quotient Rule
			Review for Exam 1
		Exam 1	Thursday, February 22
6	February 26 – 29	9.6	The Chain Rule
		5.1 & 11.2	Derivative of Exponential Functions
		5.2 & 11.1	Derivative of Logarithmic Functions (2 days)
		11.1	Quiz 3
7	March 4 - 7	10.1	1st Derivative & Graphs: Increasing/Decreasing
		10.1	1st Derivative & Graphs: Rel Max /Rel Min
		10.2	2nd Derivative and Curvature
		10.2	2nd Derivative & Inflection Points
8	March 11 - 14	10.3	Absolute Extrema
		Review	Review for Exam 2
		Exam 2	Wednesday, March 13
9	March 25 – 28	10.3	Optimization: Business & Economics
		10.4	Applications of Max and Mins
		10.4	More Applications of Max & Min & Quiz 4
10	April 1 - 4	6.1	Simple Interest
		6.2	Compound Interest
		6.3	Future Value of Annuities
		6.4	Present Value of Annuities
11	April 8 - 11	6.2 – 6.4	"Jack & Jill Problem"
		6.5	Loans and Amortization
		Quiz 5	Quiz 5
		3.1	Introduction to Matrices
12	April 15 - 18	3.2	Matrix Multiplication
		3.3	Gauss-Jordan Elimination
		3.3	Matrix Application Problems (with no solution)
		3.3	Matrix App Problems (w/ multiple solutions)
13	April 22 - 25	4.1	Linear Inequalities in Two Variables
		4.2 and Quiz 6	Linear Programming: Graphical Models & Quiz 6
14	April 29 – May 2		More Linear Programming Applications
		Exam 3	Thursday, May 2
15	May 6 - 9	Review Chpt 3-6	In-class review for Final Exam