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	Time	Days	Sec	Time	Room
	10 – 10:45 AM	Monday	1	8 AM MTWR	A208 SCI
email: grenfert@uwsp.edu	11 – 11:45 AM	Tues, Wed	2	9 AM M W	A225 SCI
	or by appointment		2	9 AM T R	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. I have 15 graphing calculators that I bring to class.

> 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 subtle changes to a function 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: GEP: QL
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 "Announced" Quiz dates)
20 % for **Exam 1**	in-class on **Thursday,** October 5
20 % for **Exam 2**	in-class on **Thursday,** November 2
20% for **Exam 3**	in-class on **Tuesday,** December 12
20% for the **Comprehensive Final Exam**	Section 1: **Monday, December 18 12:30 – 2:30 PM**
100%	Section 2: **Tuesday, December 19 2:45 – 4:45 PM**

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 in 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 <u>will not be graded</u>, 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* any 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 at the beginning of class, taking no more than 5 minutes. Pop Quizzes cannot be made up, but the "Drop Lowest" feature in the gradebook will be turned on later in the semester.   There are <u>no retakes</u> 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 <u>no retakes</u> 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 <u>when the circumstances arose</u>. 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 need to be taken, but not necessarily in this 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

Tutoring Options: The Tutoring-Learning Center (TLC) helps students in all disciplines become more effective, confident learners. All learners benefit from sharing work with knowledgeable, attentive tutors. The TLC offers <u>four tutoring services</u>:

1. **Academic Coaching**: Build skills in studying, time management, test-taking, online learning, and more.

** 2. **Course Content**: Practice problems, deepen understanding, and prepare for exams in natural resources, STEM, World Languages, and more. Link to Course Content Tutoring

3. **Reading/Writing**: Brainstorm and refine papers, essays, lab reports, citations, résumés, scholarship applications, personal writing, and more.

4. **Tech Essentials**: Develop computer literacy and learn to use UWSP-related applications such as Canvas, Microsoft 365, and Zoom. Link to Tech Essentials

To make an appointment, students can self-schedule using **Navigate**, contact the TLC office at tlctutor@uwsp.edu , call (715)-346-3568, or stop into CCC 234. Link to TLC Page

Instructor's Schedule: If the scheduled office hours do not work for you, email me with a requested day and time and I will try to make that work for you. FYI -- I share my office with 3 other instructors.

G. Renfert --- Fall 2023

	Monday	Tuesday	Wednesday	Thursday	* Friday
8:00 - 8:50	Math 109.1 SCI A208	Math 109.1 SCI A208	Math 109.1 SCI A208	Math 109.1 SCI A208	
9:00 - 9:50	Math 109.2 SCI A225	Math 109.2 SCI A225	Math 109.2 SCI A225	Math 109.2 SCI A225	
10:00 - 10:50	Office Hour		Dept Meeting		* or by appointment
11:00 - 11:50		Office Hour	Office Hour		
12:00 - 12:50					
1:00 - 1:50					
2:00 - 2:50					
3:00 - 3:50					

Week	Dates	Sections	Topic
1	Sept 5 - 7	Intro & 0.3	Course Intro & Integral Exponents
		0.4	Radicals and Rational Exponents
		1.2	Functions
2	Sept 11 - 14	1.3	Linear Functions
		1.6	Apps of Functions in Business & Economics
		2.1	Quadratic Equations
		2.2	Quadratic Functions & Quiz 1
3	Sept 18 - 21	2.3	Business Applications
		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	Sept 25 - 28	9.3	Average Rate of Change
		9.3	Instantaneous Rate of Change: The Derivative
		9.4	Derivative Formulas (shortcuts)
		9.4	(continued) and Quiz 2
5	Oct 2 - 5	9.8	Higher Order Derivatives
		9.4	Applications of Derivatives
		Review	Review for Exam 1
		Exam 1	Exam 1
6	Oct 9 - 12	9.5	The Product Rule
		9.5	The Quotient Rule
		9.6	The Chain Rule
		9.6	The Chain Rule (continued)
7	Oct 16 - 19	(5.1 &) 11.2	Derivative of Exponential Functions
		(5.2 &) 11.1	Derivative of Logarithmic Functions
		10.1	1st Derivative and Graphs
		10.1	(continued) and Quiz 3
8	Oct 23 - 26	10.2	2nd Derivative and Graphs
		10.3	Absolute Extrema
		10.4	Applications of Max and Mins
		10.4	Optimization: More Applications of Max & Min & Quiz 4
9	Oct 30 - Nov 2	10.4	Optimization (2 days)
		Review	Review for Exam 2
		Exam 2	Exam 2
10	Nov 6 - 9	6.1	Simple Interest
		6.2	Compound Interest
		6.3	Future Value of Annuities
		6.4	Present Value of Annuities
11	Nov 13 - 16		Jack & Jill Problem (2 days)
			Calculating the Rate of Return
		6.5	Loans and Amortization
12	Nov 20 - 22 (Thanksgiving)	Quiz 5	Review for Quiz 5
			Quiz 5
		3.1	Introduction to Matrices
13	Nov 27 - 30	3.2	Matrix Multiplication
		3.3.1	Solving a System using Matrices **with a Graphing Calculator**
		3.3.2	Matrix Application Problems (with no solution) **with a Graphing Calculator**
		3.3	Matrix App Problems (w/ multiple solutions) **with a Graphing Calculator**
14	Dec 4 - 7	4.1	Linear Inequalities in Two Variables & Quiz 6
		4.2	Introduction to Linear Programming
		4.2	Linear Programming: Graphical Models (2 days)
15	Dec 11 - 14		Review for Exam 3
		Exam 3	Exam 3
			Go over Exam 3 results, Review for Final Exam
			Review for Final Exam
Sec 1	Monday, Dec 18	12:30 PM	Final Exam
Sec 2	Tuesday, Dec 19	2:45 PM	