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 Science Building **email:** grenfert@uwsp.edu	T & W 2:00 – 2:50 PM *or* *by appointment*	Time Days Room 1:00 – 1:50 PM MTWR SCI A210

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 to use for homework, but you may not use apps on quizzes or
        exams. I have graphing calculators that I allow students to use in the classroom.

> 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**   Tentative Exam Dates:
20 % for **Exam   1**   in class on   **Tuesday,**   **Oct   5**
20 % for **Exam   2**   in class on   **Thursday,**   **Nov 5**
20% for **Exam 3**   in class on   **Tuesday,**   **Dec   7**
 20% for the **Comprehensive Final Exam** on   **8:00 – 10:00 AM**   **Tuesday,**   **Dec 14**
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, because of one low exam score early
        in the course). I will not use discretionary judgments to lower a student's final grade.

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 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

For Academic Support:

1) Attend class and ask questions as they arise.

2) Visit me during my office hours, arrange to see me at another time, or email me your questions.

3) Tutoring services are available.

Tutoring

The Tutoring-Learning Center (TLC) offers **FREE** tutoring to support you in your math classes. The tutors are UWSP students who have done well in their classes and who are here to share their successful study habits and math content knowledge to help others succeed. Discussing mathematical 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 the TLC in ALB 018 (library basement), email (tlctutor@uwsp.edu), or call (715) 346-3568.

STEM Tutoring – Fall 2021

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	By appointment. Visit ALB 018 (library basement) to make a request or complete online request form here: https://www.uwsp.edu/tlc/Pages/request-math-science-tutoring.aspx.	Free

Gretchen Renfert's Schedule:

	Monday	Tuesday	Wednesday	Thursday	* Friday
8:00 - 8:50					
9:00 - 9:50					
10:00 - 10:50	Math 107.7 SCI A208	Math 107.7 SCI A208	Dept Meeting	Math 107.7 SCI A208	Math 107.7 SCI A208
11:00 - 11:50	Math 118.1 SCI A208	Math 118.1 SCI A208	Math 118.1 SCI A208	Math 118.1 SCI A208	
12:00 - 12:50	Lunch				
1:00 - 1:50	Math 109.3 SCI A210	Math 109.3 SCI A210	Math 109.3 SCI A210	Math 109.3 SCI A210	
2:00 - 2:50		Office Hr SCI B348	Office Hr SCI B348		
3:00 - 3:50					
4:00 - 4:50					

This course runs only from **Oct 25 – Dec 10**

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Tentative Math 109 Schedule

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Week	Dates	Section	Topic
1	Sept 2 - 3	0.3	Introduction; Integral Exponents
2	Sept 7 - 10 (Labor Day Week)	0.4	Radicals and Rational Exponents
		1.2, 1.3	Functions, Linear Functions
		1.6	Apps of Functions in Business & Economics
3	Sept 13 - 17	2.1	Quadratic Equations
		2.2	Quadratic Functions
		2.3	Business Applications
		2.4 & **Quiz 1**	The Special Functions and **Quiz 1**
4	Sept 20 - 24	Appendix A	Using a Graphing Calculator or Graphing App
		9.1	Limits Graphically
		9.1	Limits Algebraically (and a Review of Factoring)
		9.3	The Average Rate of Change
5	Sept 27 - Oct 1	9.3	The Derivative: The Instantaneous Rate of Change (2 days)
		9.4	Derivative Formulas (Shortcuts)
		9.8 & **Quiz 2**	Higher Order Derivatives and **Quiz 2**
6	Oct 4 - 8	Review	Review for **Exam 1**
		Exam 1	**Tuesday, Oct 5**
		9.5	The Product Rule
		9.5	The Quotient Rule
7	Oct 11 - 15	9.6	The Chain Rule (2 days)
		5.1 & 11.2	Derivatives of Exponential Functions
		Quiz 3	**Quiz 3**
8	Oct 18 - 22	5.2 & 11.1	Derivatives of Logarithmic Functions
		11.2	Apps of Exponential & Log Functions
		10.1	1st Derivative and Graphs (2 days)
9	Oct 25 - 29	10.2	2nd Derivative and Graphs (2 days)
		10.3	Absolute Extrema
		Quiz 4	**Quiz 4**
10	Nov 1 - 5	10.3	Optimization
		10.4	Applications of Maxima & Minima
		Review	Review for **Exam 2**
		Exam 2	**Thursday, Nov 5**
11	Nov 8 - 12	6.1	Simple Interest
		6.2	Compound Interest
		6.3	Future Value
		6.4	Present Value
12	Nov 15 - 19	6.5	Loans and Amortization & Rate of Return (2 days)
		Review	Review for Quiz
		Quiz 5	**Quiz 5**
13	Nov 22 - 24 (Thanksgiving Week)	3.2	Introduction to Matrices
		3.3	Gauss-Jordan Elimination
		3.3	Matrix Application Problems (That have no solution)
14	Nov 29 - Dec 3	3.3	Matrix Application Problems (That have multiple solutions)
		4.1 & **Quiz 6**	Linear Inequalities in Two Variables & **Quiz 6**
		4.2	Linear Programming: Graphical Models (2 days)
15	Dec 6 - 10		Review for **Exam 3**
		Exam 3	**Tuesday, Dec 7**
			In-class review for Final Exam (2 days)
	Tuesday, Dec 14	**Final Exam**	**8:00 – 10:00 AM, SCI A210**