

MATH 105: Mathematics Applications, Appreciation & Skills

Spring 2022, Rm 218 Wausau, Rm 135 MSF, at 9:00-9:50 Tue, Thur, Fri.

Instructor: Paul A. Martin Office 087-B(Wausau), Telephone 261-6272, pmartin@uwsp.edu

Office Hours: 10:00 –10:50 on M, T, Th, F These will be either in person at my office or before or after class or remotely through my personal zoom meeting room with pass-code 3.14 at <https://wisconsin-edu.zoom.us/j/6721469784?pwd=TzNONExrZnNOUEJwS2RIMG9kbTVmQT09> . I am also happy to meet at other times; Just send me an email or leave a phone message requesting a meeting. **DUO Labs are also available for extra help. DUO in rooms 224WAU and 107MSF.**

Text: *The Heart of Mathematics: An Invitation to Effective Thinking*, 3rd-ed. by Edward Burger & Michael Starbird. This book introduces students to many important and interesting ideas in mathematics while inspiring them to actively engage in effective mathematical thinking.

Critical Thinking Learning Objectives: This course focuses on “the intention to develop in students critical thinking skills across the disciplines”. We will explore some of the great ideas in mathematics - comparable to the works of Shakespeare and Plato. Mathematics is an artistic endeavor, which is shaped by each person's imagination and creativity. In mathematics, critical thinking helps us identify mathematical problems, transform them into solvable problems, and then solve them using appropriate techniques. Mathematics is like most endeavors in that persistence, focus, and contemplation foster a deeper and enduring understanding of concepts.

This course satisfies the UWSP **Quantitative Literacy Learning Outcomes:**

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

For more information see <http://www.uwsp.edu/acadaff/Pages/generalEducation.aspx>

Calculators: This course will be more concerned with mathematical ideas than formulas or computations, and so for the most part, calculators will not be necessary, but they will be handy. A smart calculator will suffice for most of the work we will do. **For exams, only a non-smart phone calculator will be allowed.**

Homework: Homework problems (mostly from the text) will be assigned each week. You will be asked to post your solutions in Canvas by uploading a scan or picture of your work. The problems for each week will be listed in Canvas under Assignments. The due dates will be Monday night at midnight of the week following when the material is covered. Comment on one other person's post to earn up to 5% extra credit that assignment. The homework grade will account for half of the course total! You should be able to get almost all of these points if you come to class, ask questions as needed and take advantage of office hours as needed. You should be spending ~6 hours/wk for this course outside of class doing homework/reading etc.

Exams: There will be three hour-exams. The exams will be open book and notes and will consist of problems of the same nature as what you do in the homework sets. These will count for 300 points total or 30% of your grade.

Course Project: Each student will need to select some mathematically related topic or problem of personal interest outside or beyond what we cover in this class and prepare a ~10-minute PowerPoint presentation to the class on the day of the final exam or possibly in the last few days of class. This may be a topic that is related to your discipline, for instance, or you may choose to depict a mathematical idea in a creative way (via a song or poem, for example). You may work individually or in a group of two (collaboration is encouraged - it's more fun!). This will count 200 points towards your final grade. There will be one or two consults through the semester to discuss your project and your presentation preparation.

Grades: The cut-off scores for A, B, C, D, F-grades will be very close to 90, 80, 70, and 60%.

Homework	500
Hour-exams	300
Project	200
Total	500

Tentative Schedule for the Semester

Week	Sections	Content / Homework
Jan 24	1.1 – 1.4	Mathematics Puzzlers and Logical solutions: 1.4 4, 7, 10, 11, 12, 15, 16, 19 (do 5)
Jan 31	2.1 – 2.3	Rough Estimates, Fibonacci Sequence, Prime Numbers: 2.1 2, 6, 10, 11, 14 (do 3). 2.2 1, 8, 9, 15, 19, 21, 30 (do 4) 2.3 1(1 st 20), 13, 17 (do 2)
Feb 7	2.3 – 2.5	Clock arithmetic and Bar Codes and Secret Coding: 2.3 20, 29, 33, 34 (do 2), 2.4 3, 5, 8, 10, 11, 33 (do 4), 2.5 1, 2 (do both)
Feb 14	2.5 – 2.7	RSA encryption, Irrational Numbers, Decimal #'s and Real # line: 2.5 4, 10 & 11(modified as in Canvas). 13, 14 (do 3) 2.6 3, 4, 9, 12, 18, 30 (do 4) 2.7 1, 4, 16, 20, 21, 23, 36 (do 4).
Feb 21	3.1-3.3	
Feb 28	3.5, 4.1, 4.3	
Mar 7	4.5, 4.6	
Mar 14	Exam I	
Spring Break is from March 21-25		
Mar 28	Ch 5 Topology	
Apr 4	Ch 6 Fractals	
April 11	Ch 7 Probability	
April 18	Ch 7/9 Probability	
April 25	Ch 8 Statistics	
May 2	Ch 8 Statistics	
May 9	Exam II	

UWSP Statement on COVID19 Safety Precautions:

- At all UW-Stevens Point campus locations, the wearing of face coverings is mandatory in all buildings, including classrooms, laboratories, studios, and other instructional spaces. Any student with a condition that impacts their use of a face covering should contact the [Disability and Assistive Technology Center](#) to discuss accommodations in classes. Please note that unless everyone is wearing a face covering, in-person classes cannot take place. This is university policy and not up to the discretion of individual instructors. Failure to adhere to this requirement could result in formal withdrawal from the course.

Other Guidance:

- Please monitor your own health each day using [this screening tool](#). If you are not feeling well or believe you have been exposed to COVID-19, do not come to class; email your instructor and contact Student Health Service (715-346-4646).
 - As with any type of absence, students are expected to communicate their need to be absent and complete the course requirements as outlined in the syllabus.
- Maintain a minimum of 6 feet of physical distance from others whenever possible.
- Do not congregate in groups before or after class; stagger your arrival and departure from the classroom, lab, or meeting room.
- Wash your hands or use appropriate hand sanitizer regularly and avoid touching your face.
- Please maintain these same healthy practices outside the classroom.