

Math 303: Introduction to Concepts of Mathematics, Spring 2023

Instructor: Kevin Milans (milans@math.wvu.edu)

Class Meetings: MWF 11:30am-12:20pm in Hodges Hall 307

Office Hours: MW 2:00pm-3:00pm and by appointment, in Armstrong Hall 408H

Webpage: <http://www.math.wvu.edu/~kgmilans/teaching/sp23/math303/>

Prerequisite: Math 156

Welcome: Welcome to Math 303: Introduction to Concepts of Mathematics. This class will probably be unlike any other math class you have ever taken. Learning mathematics is analogous to learning a language. Many lower level mathematics classes (especially those geared toward general audiences and not math majors) teach a few important phrases that are useful in answering certain types of problems. This class is different: we wish to be able to respond creatively and correctly to all kinds of problems, even those with which we are not already familiar.

This is an ambitious goal, and one that is never fully achieved. Indeed, a professional mathematician spends a lifetime honing these skills. Mathematics is not a sport for the easily discouraged; it takes a lot of effort and determination to make progress. The reward for success is a deeper command of mathematics and, more generally, a stronger mind. Let's get started.

Learning Outcomes and Course Goals: Students will become familiar with the language of mathematics, including definitions, theorems, conjectures, and proofs. Students will read, critique, and write mathematical proofs, requiring the use of elementary logic, sets, relations, and functions.

Textbook: Required: *Book of Proof*, by Richard Hammack. Optional: *Mathematical Reasoning*, by Ted Sundstrom. Both texts available online for free under a Creative Commons License.

Homework: Homework is assigned roughly once a week. In mathematics classes, most of your learning occurs while doing homework exercises. You are strongly encouraged to work on the homework with other students in the class, but your written work must be your own. In particular, *you must fully understand everything written down on your paper under your own name*. You may not obtain answers to homework exercises by using search engines, other textbooks, scholarly research articles, or other resources. Claiming the work of others as your own is a serious violation of academic integrity known as plagiarism. It also robs you of your chance to learn and defeats the purpose of the homework.

Homework will generally be assigned on Wednesdays and due the following Wednesday. Homework is evaluated on *completeness*, and, depending on availability of resources, *correctness* on selected problems. Your homework is expected to be neat and conform to accepted standards for professional work-products. Handwriting must be clearly legible, and margins must be respected. Except for excused absences, late homework is not accepted. Your lowest two homework scores are dropped.

Homework Workshops: Homework workshops will be held weekly. The sessions are dedicated to working on the current homework assignment in small groups (at most 3 students per group). Students are encouraged to make serious attempts to solve some problems before the weekly sessions. Students will discuss the problems, brainstorm ideas, and find solutions together. The instructor will be available for assistance and to offer hints. Attendance is optional but recommended.

Homework Time Impact: Please plan to spend an average of about 10 hours per homework assignment. Part of learning involves trying approaches that do not work. This takes time and can be frustrating, but take heart! Everyone who studies mathematics seriously goes through the same struggle, so you are not alone. Just make sure you allot enough time.

Quizzes: We will have short quizzes in class on most Fridays. Quizzes cover material on the corresponding homework. No calculators or other aids are permitted. No make-up quizzes are offered. Your lowest two quiz scores are dropped.

Tests: There will be 3 tests, each covering between 1/4 and 1/3 of the course material. You may use a permitted calculator and one 8.5 by 11 inch sheet of *handwritten* notes during each test. No other aids are permitted. The tests are scheduled for **Fri. Feb. 3, Fri. Mar. 10, and Fri. Apr. 14**. In accordance with the make-up policy, your lowest test score will be replaced by your score on the final exam if doing so will help your grade.

Final Exam: The final exam is **Thurs., May 4, 11:00am-1:00pm**. All students must take the final exam during the scheduled exam period, unless specifically exempted by university rules. You may use one 8.5 by 11 inch *handwritten* sheet of notes during the final. No other aids are permitted. The final exam is cumulative.

Attendance: Attendance is expected. Leaving class early or arriving late is disruptive and counts as an absence. Failure to take quizzes/tests and failure to collect quizzes/tests when returned is considered evidence of absence. Students who miss 5 or fewer classes earn an attendance bonus of 2%. All absences, including those related to university Days of Special Concern, are counted against the attendance bonus.

Expected Classroom Behavior: Talking with your neighbors, reading material unrelated to the course, listening to audio entertainment on your headphones, texting, and using a cell phone are not permitted in class.

Grading Rubric: Each homework, quiz, and test is converted to an decimal percentage and weighted equally with other like assessments. The tables below show how course averages are computed and converted to letter grades. The instructor reserves the right to lower these thresholds.

Homework	20%
Quizzes	15%
Tests	$15\% \cdot 3 = 45\%$
Final Exam	20%
Total	100%
Attendance Bonus	2%

A: 90–100	B: 80-89.9
C: 70-79.9	D: 60-69.9
F: 0-59.9	

Make-up Policy: Excused absences that result in a missed work are, to the extent possible, accommodated by dropping the assessment (homeworks/quizzes) or by final exam score replacement (tests). Excused absences have the highest priority for dropping/replacing an assessment. In the event that a student's excused absences exhaust the provisions for dropping/replacing, make-up work may be required. Students must notify the instructor of excusable absences as soon as possible.

Regrade Policy: Regrades may be requested by submitting the original work with a written explanation of your request up to 1 week after the work is returned. Regrade requests are to be used to correct errors in grading. Regrade requests that challenge the amount of a deduction are usually not considered, since deductions for common mistakes are applied uniformly to all students. When regrading, the entire problem(s) in question will be reviewed, and all discovered errors in grading (including any that previously favored the student) will be corrected. The resulting grade may be higher than, equal to, or lower than the original.

Academic Integrity: You are expected to practice the highest possible standards of academic integrity. Any deviation from this expectation will, at a minimum, result in an academic penalty of a score of zero on the assignment or test in question. Additional disciplinary measures are possible. For more information, see the university's Student Conduct Code.