

# Math 293E/Math 183: Math Reasoning, Spring 2016

**Instructor:** Kevin Milans ([milans@math.wvu.edu](mailto:milans@math.wvu.edu))

**Class Meetings:** TuTh 10:00am-11:15am in Armstrong Hall 313

**Office Hours:** MTuTh 11:30am-12:30pm, and by appointment, in Armstrong Hall 408H

**Webpage:** <http://www.math.wvu.edu/~milans/teaching/sp16/math293E/>

**Welcome:** Welcome to Math 293 (Future Math 183): Introduction to Mathematical Reasoning. 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 arguments. Specific examples are drawn from elementary set theory, geometry, algebra, and combinatorics.

**Textbook:** *Everything You Always Wanted To Know About Mathematics*, by Brendan W. Sullivan.

**Homework:** 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, because doing so would defeat the purpose of the homework.

Late homework is not accepted. Your two lowest homework scores are dropped. Homework will be collected and graded.

**Evening Homework Sessions:** Evening homework sessions will be held once a week. The evening 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. The instructor reserves the right to cancel the evening homework sessions if they are consistently not sufficiently well-attended.

**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 and conducts research in mathematics 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 Thursdays. Quizzes cover material on the corresponding homework. Each quiz will feature at least one problem that is very similar to a homework problem. You may use a calculator. No other aids are permitted. Cell phones may not be used as calculators. No make-up quizzes are offered. Your lowest two quiz scores are dropped.

**Tests:** There will be 2 tests, administered in class. No make-up tests are offered. However, I will replace one of your test scores with your score on the final exam if doing so will help your course average. You may use a calculator and one 8.5 by 11 inch *handwritten* sheet of notes during each test. No other aids are permitted. Cell phones may not be used as calculators. Each test covers roughly 1/4 of the course material. The tests are tentatively scheduled for **Thurs. Feb. 18 and Thurs. Apr. 7.**

**Final Exam:** The final exam is Tuesday, May 3, 7:00pm-9:00pm. All students must take the final exam during the scheduled exam period, unless specifically exempted by university rules. Students who miss the final exam will receive a score of zero. You may use a calculator and one 8.5 by 11 inch *handwritten* sheet of notes during the final. No other aids are permitted. Cell phones may not be used as calculators. 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 3 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.

**Classroom Participation:** A bonus of up to 2% is possible for excellent classroom participation. The bonus is to be earned cooperatively by all students in the course, and all students receive the same classroom participation bonus. Activities that have a positive effect on the classroom participation bonus include asking and answering mathematical questions. To earn a high classroom participation bonus, a large portion of the class must ask or answer questions occasionally. Activities that are not permitted in class have a strong negative effect on the classroom participation bonus.

**Grading Rubric:** Course averages are converted to letter grades according to the scale on the right. The instructor reserves the right to lower these thresholds.

Homework	30%
Quizzes	20%
Tests	$15\% \cdot 2 = 30\%$
Final Exam	20%
Total	100%
Attendance Bonus	2%
Classroom Participation Bonus	up to 2%

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

**Make-up Policy:** No make-up quizzes or tests will be offered. To compensate for this strict policy, your lowest two quiz grades are dropped and your lowest test score will be replaced by your final exam score (if doing so improves your course average). This policy covers all absences, including absences due to university Days of Special Concern. In truly exceptional cases, students may be excused from additional quizzes or tests. Students with such exceptional circumstances should contact the instructor as soon as possible, and appropriate arrangements will be made on a case by case basis.

**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.