

MATH 3309: Survey of Basic Mathematical Theory II

Sul Ross State University ~ Rio Grande College
Fall 2014

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Course Description MTH 3309 is intended as a survey of basic mathematical theory for future elementary teachers, covering algebra, statistics, and probability.

Course Objectives Students will be introduced to the rational number system and the real number system; use ratios, proportions, and percents to solve applied problems; qualitatively and quantitatively analyze sets of statistical data; be introduced to the basic techniques of statistical inference; work with experimental probability; and learn the basic principles of counting and use them in problems of theoretical probability.

TEKS Information on the Texas Essential Knowledge and Skills can be found on the TEA website: <http://www.tea.state.tx.us>

Class Time Tuesday, 6:00 – 8:45 p.m.

Class Location Del Rio 103; Eagle Pass B114; Uvalde B110

Required Text Long, DeTemple, & Millman, *Mathematical Reasoning for Elementary Teachers*, Seventh Edition, ISBN 0321900995

Office Hours Monday – Thursday, 10:00 a.m. – 12:00 p.m.

Course Policies

Attendance Policy

Attendance is mandatory. **You may be dropped from the course if you accumulate nine absences**, in accordance with University policy. One class period amounts to three absences. Arriving in class late or leaving early may be counted as a partial absence. It is your responsibility to notify me if you will be absent for any reason.

You will be held responsible for all material covered in class or the assigned text. If you have to miss a class, it is your responsibility to obtain all notes, assignments, and announcements from someone else in the class. Make-up exams will be given only in the event of an emergency, in which case written justification and/or documentation must be provided and approved.

Unless you have special permission, you are required to attend class at the site for which you are registered. This is especially true on exam days. **Failure to take an exam at the site for which you are registered may result in a zero on the exam.**

Communication

I will post course documents, reminders, and announcements on the Blackboard system. I may also occasionally send announcements via e-mail. You should make sure you know how to access and use these tools. E-mail is the best way to contact me.

You are welcome to stop by my office if you wish to speak about the content or your progress in the course. **I am here to help you.** Ask questions in class, call me, e-mail me, or come to my office. If you don't communicate with me, then I can't help you.

Homework

Homework will be assigned for each section that we cover in the text. Although the homework will not be collected and graded, you should regard it as the most essential component of the course. It is very important that you complete each homework assignment before the next class period. This will allow you to make the most of our time together. If you have a question, ask about it. If you don't understand the homework, you are not ready to take the exam.

In order to achieve success in this course, you must work all the homework assignments in a timely manner!!! The amount of work for any college class is generally calculated as 3 hours of outside work for each hour in class. **That means you should expect to spend as much as 8 – 9 hours each week on outside work in this course.**

We will always have time to discuss the homework in class, and we may also work on problems together in groups. You should come to class prepared: make sure to have your textbook and suitable writing materials with you.

Grading Policy

Your grades will be weighted as follows:

Exam 1	30%
Exam 2	30%
Final Exam	40%

A student who averages at least 90% will receive an A; at least 80% will receive at least a B; at least 70% will receive at least a C; at least 60% will receive at least a D.

Exams

There will be two midterm exams. The tentative dates are

Exam 1	September 30
Exam 2	October 28

This schedule is subject to change. You will be notified of a change at least one week in advance. Make-up exams will be given only in the event of an emergency, in which case written justification and/or documentation must be provided and approved.

The final exam is scheduled for Tuesday, December 9, from 6:00 – 8:45 p.m. It will be comprehensive.

Subject Outline

Below is a tentative outline of the subjects we will cover in this course. We will adhere to the textbook fairly closely. Next to each unit is the corresponding section from the textbook.

I. Rational numbers and real numbers

1. Fractions (§6.1): *basic concepts – representations and manipulatives – equivalent fractions – fractions in simplest form – common denominators – ordering*
2. Addition and subtraction of fractions (§6.2): *addition of fractions – addition with manipulatives – proper fractions and mixed numbers – subtraction of fractions – subtraction with manipulatives*
3. Multiplication and division of fractions (§6.3): *multiplication of fractions – multiplication as an operator – the area model – division of fractions – division with pictures – the invert-and-multiply rule*
4. Rational numbers (§§6.1,4): *the rational number system – properties of arithmetic – the density property – applications*
5. Decimals and real numbers (§§7.1 – 2): *the decimal system – powers of ten – terminating decimals and fractions – repeating decimals and fractions – irrational numbers and real numbers – the number line – arithmetic with decimals*
6. Ratios, proportions, and percents (§§7.3 – 4): *ratios – proportions – proportional reasoning – percents*

II. Statistics

1. Organizing and representing data (§13.1): *dot plots – stem-and-leaf plots – histograms – line graph – bar graphs – pie charts – pictographs – cautions*
2. Measuring the center and variation of data (§13.2): *the mean – the median – the mode – upper and lower quartiles – outliers – box plots – the standard deviation*
3. Statistical inference (§13.3): *the role of statistical inference – biased studies and random samples – estimating the mean and standard deviation of a population – distributions – z-scores and percentiles*

III. Probability (Chapter 14)

1. The basics of probability (§14.1): *basic terminology – experimental probability – theoretical probability – the addition principle – complementary events*
2. Principles of counting (§14.2): *the addition principle – permutations – the multiplication principle – conditional probability – compound events – independent events*
3. Permutations and combinations (§14.3): *permutation vs. combination – notation – formulas – Pascal's identity – applications*

4. Odds and expected value (§14.4): *odds – expected value*

Schedule

This schedule is tentative only. The unit numbers refer to the above outline.

Unit I	August 26 – September 23
Exam 1	September 30
Unit II	September 30 – October 21
Exam 2	October 28
Unit III	October 28 – December 2
Final Exam	December 9

Americans With Disabilities Act

Sul Ross State University is committed to equal access in compliance with the Americans With Disabilities Act of 1973. It is the student's responsibility to initiate a request for accessibility services. Students seeking accessibility services must contact Kathy Biddick, Student Services Administrative Secretary.