

MATH 3308: Survey of Basic Mathematical Theory II

Sul Ross State University Rio Grande College
Summer II 2020

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Course Description MTH 3309 covers geometric concepts, probability, statistics, estimation, problem solving, and other related topics.

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

Class Meetings This class was originally scheduled as a teleconference course. Due to current social-distancing precautions, all Sul Ross courses have been moved to an online format. The class will meet online on Tuesdays and Thursdays from 3:00 – 4:45 using Zoom web conferencing.

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

Course Policies

Attendance Policy

The class will meet online on Tuesdays and Thursdays from 3:00 – 4:45 using Zoom web conferencing. Zoom works well on multiple devices, including laptops, tablets, and smart phones. Attendance at these meetings is mandatory and contributes toward your participation grade. You will need to have your webcam turned on.

That being said, I recognize that you may have varying access to technology. If participating in our class meetings will pose a problem, please contact me as soon as possible so that we can make alternative arrangements for your participation grade. Class meetings will be recorded and posted to YouTube. Alternative arrangements will include certifying that you have watched these videos, providing evidence that you have taken notes, and completing other requirements.

You will be held responsible for all material covered in class, recorded mini-lectures, and the assigned text.

Communication

The Blackboard system will be used to provide course materials and post grades. You are welcome to e-mail, call, or text me at any time. My cell number is **(830) 333-0164**. Please identify yourself in your text or voicemail. Please make sure to check the e-mail address associated with Blackboard on a regular basis.

Mini-Lectures and Class Meetings

A sequence of three to five recorded mini-lectures will be posted on YouTube and linked to from

our Blackboard course page. Fill-in-the-blank slides will be provided for you to print out and complete as you watch the mini-lectures. You should watch the mini-lectures, complete the slides, and complete as much of the assigned homework as possible before each class period.

The class period will be used to discuss homework and answer other questions. It is important that you be ready to ask questions when the class period begins. Make sure to have your textbook and suitable writing materials handy. Each class period will be recorded and uploaded to YouTube.

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 20 hours each week on outside work in this course.

Grading Policy

Your grades will be weighted as follows:

Participation	30%
Midterm Exam	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 one midterm exam. It will be administered on Blackboard on Wednesday, July 22. You may begin the exam anytime from 5:00 – 7:00 p.m. You will have two hours to complete the exam. If taking an online exam at this time poses a problem, please notify me as soon as possible.

There will be a comprehensive final exam. It will be administered on Blackboard on Friday, August 7. You may begin the exam anytime from 5:00 – 7:00 p.m. You will have three hours to complete the exam. If taking an online exam at this time poses a problem, please notify me as soon as possible.

Subject Outline

Below is a tentative outline of the subjects we will cover in this course. Next to each topic section is the corresponding section from the textbook. As time allows, we will also make excursions into the practical aspects of math education in a region with limited access to educational resources.

I. Integers

1. Representations of integers (§5.1): *the integers – what we want in a representation – colored counters – mail-time (money) stories – number-line representations*
2. Addition and subtraction of integers (§5.2): *addition with representations and manipulatives – properties of addition – subtraction with representations and manipulatives – ordering the integers*
3. Multiplication and division of integers (§5.3): *multiplication with representations and manipulatives – properties of multiplication – division of integers*

II. 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*

III. Statistics

1. Organizing and representing data (§13.1): *dot plots – stem-and-leaf plots – histograms – line graphs – 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*

IV. 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	July 2 – 7
Unit II	July 7 – 21
Midterm Exam	July 22
Unit III	July 23 – 28
Unit IV	July 30 – August 6
Final Exam	August 7

University Statements

Distance Education Statement: *Students enrolled in distance education courses have equal access to the university's academic support services, such as Smarthinking, library resources, online databases, and instructional technology support. For more information about accessing these resources, visit the SRSU website. Students should correspond using Sul Ross email accounts and submit online assignments through Blackboard, which requires secure login information to verify students' identities and to protect students' information. The procedures for filing a student complaint are included in the student handbook. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website.*

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 in Student Services, Room C-102, Uvalde campus. The mailing address is 2623 Garner Field Road, Rio Grande College-Sul Ross State University, Uvalde, Texas 78801. Telephone: 830-279-3003. Email: kbiddick@sulross.edu.*