

MTH 3309: Survey of Basic Math Theory II

Sul Ross State University Rio Grande College

Fall 2022

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Course Description Fractions and decimals, 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 Tuesday and Thursday, 2:00 – 3:15

Class Location Del Rio 109; Eagle Pass B111; Uvalde B113; or synchronous online as determined by university administration in response to pandemic conditions.

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

Course Policies

Attendance Policy

Attendance is mandatory. Students are expected to attend class in person in their classroom of registration unless permission is given for extenuating circumstances. You will be held responsible for all material covered in class or in the reading assignments. 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.

Communication

The Blackboard system will be used to provide course materials, submit assignments, 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.

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	10%
Exam 1	25%
Exam 2	25%
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	February 22
Exam 2	March 29

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 Monday, May 2, from 2:00 – 4:00 p.m. The final exam will be comprehensive.

Subject Outline

Below is a tentative outline of the subjects we will cover in this course. As time allows, we will also make excursions into the practical aspects of mathematics education among underserved populations in a region with limited access to educational resources.

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 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*

III. Probability (Chapter 14)

1. The basics of probability (§14.1): *basic terminology – experimental probability – theoretical probability – the addition principle – complementary events*
2. Odds and expected value (§14.4): *odds – expected value*

IV. Geometry (Chapters 9 – 10)

1. Figures in the plane (§9.1): *points and lines – distance – angles and triangles*
2. Curves and polygons in the plane (§9.2): *curves and regions – polygons – quadrilaterals – regular polygons*
3. Figures in space (§9.3): *planes and lines in space – curves, surfaces, and solids – polyhedra – regular polyhedra – cones and cylinders*
4. The measurement process (§10.1): *the measurement process – units – length – area – volume and capacity – weight and mass – temperature – unit analysis*
5. Area and perimeter (§10.2): *measurement of area – area of polygons – length of a curve – perimeter – circumference of a circle – area of a circle*
6. Volume and surface area (§§10.3 – 4): *volume of prisms, cylinders, pyramids, cones, and spheres – surface area of prisms, cylinders, pyramids, cones, and spheres*

Students will reinforce and master competencies through homework assignments and in-class group homework discussions, and demonstrate mastery on exams.

Schedule

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

Unit I	January 11 – February 17
Exam 1	February 22
Unit II	February 24 – March 16
<i>Spring Break</i>	<i>March 8 – 12</i>
Unit III	March 16 – 24
Exam 2	March 29
Unit IV	April 1 – 26
Final Exam	May 2

University Statements

Distance Education Statement: *Students enrolled in distance education courses have equal access to the university's academic support services, such as 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. 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. Directions for filing a student complaint are located in the student handbook.*

SRSU Disabilities Services: *Sul Ross State University (SRSU) is committed to equal access in compliance with Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request each semester for each class. RGC students seeking accessibility services should contact Paulette Harris, Executive Assistant to the Vice President and Dean, at 830-279-3023 or email pharris@sulross.edu. Ms. Harris's office is at 2623 Garner Field Road, Uvalde, TX 78801 (this is the mailing address, too).*

University Libraries: *The Sul Ross Library offers FREE resources and services to the entire SRSU community. Access and borrow books, articles, and more by visiting the library's website, library.sulross.edu. SRSU RGC students may request InterLibrary Loans (ILLs) and book check outs from the Sul Ross Library to be picked up at the SWTJC library that is most convenient. Access requires your LoboID and password. Librarians are a tremendous resource for your coursework and can be reached in person, by email (srsulibrary@sulross.edu), or phone (432-837-8123).*

The Southwest Texas Junior College (SWTJC) Library is also available on each campus for your physical use of the space or checking out books. Del Rio, Eagle Pass, and Uvalde students may use online resources available through SWTJC website, library.swtjc.edu. These libraries serve as pickup locations for your ILL or Document Delivery or book requests; to do so, choose the appropriate pick-up location when requesting materials from the Alpine campus.