

MATH 3308: Foundations of Elementary Mathematics I

Sul Ross State University

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Course Description MTH 3308 is intended as an introduction to numeration systems, foundations of arithmetic, fractions and decimal numbers, measurement concepts, and problem solving

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

Marketable Skills (1) Logical and analytical skills. (2) Problem-solving using analytic and algebraic methods. (3) Use of technology in problem-solving and presentation. (4) Communication and pedagogical skills.

Class Meetings Asynchronous

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

Office Hours Monday-Thursday: 8:00 am - 10:30 am; or by appointment.

Course Policies

Communication

I will post course documents, reminders, announcements, and assignments on Blackboard. You will also submit homework on Blackboard. I may also occasionally send announcements via e-mail. You should make sure you know how to access and use these tools. You are welcome to email, telephone, or text me. However, if you choose to contact me, please state your name at the beginning of any message. I am here to help you!

Grading Policy

Your grades will be weighted as follows:

Discussion / Participation	10%
Online Quiz	20%
Homework	20%
Midterm Exam	20%
Final Exam	30%

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.

Discussion/ Participation

This course is fully asynchronous, so participation will be based on your engagement with course materials and online activities rather than physical attendance. To receive full credit, you should regularly watch recorded lectures, review uploaded materials, complete quizzes and assignments on time, and actively participate in discussion posts and class activities. There will be online quizzes and discussion activities throughout the semester, so please stay engaged and avoid missing deadlines.

Homework

Homework will be assigned for each section covered in the textbook. It is a vital component of the course. Completing each assignment before the next class is essential for meaningful participation and overall success. If you encounter difficulties, be sure to ask questions; mastery of the homework material is necessary for exam readiness. As a guideline, you should expect to spend approximately 9 hours per week on coursework outside of class.

Online Quizzes

There will be online quizzes throughout the semester, and you should expect at least two quizzes each week. These quizzes are designed to help prepare you for the TExES exam by providing practice with similar types of questions and problem-solving skills. Quizzes will be posted after selected topics are completed, so it is important to stay current with the recorded lectures, notes, and course materials. You will receive automatic feedback after each quiz for both correct and incorrect responses to help strengthen your understanding of the material.

Exams

There will be one midterm exam. 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 comprehensive final exam will take place at the time scheduled by the university, during the final exam period at the end of the semester. Official time and date to be announced once the university publishes the final exam schedule.

Subject Outline

Below is a tentative subject outline and schedule for this course. Next to each topic section is the corresponding section from the textbook

I. Sets and whole numbers

1. Sets (§2.1): basic concepts, notation, set operations and relations.
2. The whole numbers (§2.2): the history and psychology of counting, one-to-one correspondence, counting and cardinality, the less-than relation.
3. Addition and subtraction of whole numbers (§2.3): addition of whole numbers, models for addition, properties of addition, subtraction of whole numbers, models for subtraction.
4. Multiplication and division of whole numbers (§2.4): multiplication of whole numbers, models for multiplication, properties of multiplication, division of whole numbers, models for division, division with remainders.

II. Divisibility of whole numbers

1. Divisibility (§4.1): divisors and multiples, odd and even, prime numbers, factor trees, prime power representations, applications, two questions about primes, the Sieve of Eratosthenes.
2. Greatest common divisors (§4.3): the greatest common divisor, the listing method, the prime factorization method, the Euclidean algorithm, the least common multiple methods.

III. Numeration and computation

1. Numeration systems (§3.1): primitive systems, the Egyptian system, the Roman system, the Babylonian system, the Mayan system, the Indo-Arabic system.
2. Non-decimal positional systems (§3.4): positional systems and manipulatives, converting between systems.
3. Algorithms for adding and subtracting whole numbers (§3.2): addition with representations and manipulatives, subtraction with representations and manipulatives
4. Algorithms for multiplying and dividing whole numbers (§3.3): multiplication with representations and manipulatives, the lattice method, multiplication in non-decimal systems, division with representations and manipulatives.

IV. 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.

V. Fractions and rational 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 invert-and-multiply rule
4. Rational numbers (§§6.1,4): the rational number system, properties of arithmetic, the density property and applications.

VI. Algebraic Reasoning, Graphing, and Connections with Geometry

1. Variables, Algebraic Expressions, and Functions (§8.1): Basic concepts, Identifying the Role of Variables, Forming Algebraic Expressions, Solution of equations, Defining and Visualizing Functions, Domain and Range of a Function, Vertical-line test.
2. Graphing Points, Lines, and Elementary Functions (§8.2): The Cartesian Coordinate Plane, Plotting Points, The Distance Formula, Line, Line Segment, and Length of Line Segment, Slope of a Line Segment or Line, Point–Slope Form of the Equation of a Line, Slope–Intercept Form of the Equation of a Line, Linear Function, Quadratic Function, Exponential Function.
3. Connections between Algebra and Geometry (§8.3): Triangle, Side, Isosceles Triangle, Parallel and Perpendicular Lines, Line Joining the Midpoints of Two Sides of a Triangle, Condition for parallel Lines, Condition for Perpendicular Lines, Circle, Center, Radius, and Diameter of a Circle, Equation of a Tangent Line to a Circle at a Point

QEP Mapped Course

Course Design: Communication Infused

To be successful in college and beyond, many sources (e.g., Morreale & Pearson, 2008) indicate that communication competencies are essential. Sul Ross recognizes that the current generation of undergraduate university students should receive training to navigate a global world as competent communicators in various contexts and channels of communication.

Through our Quality Enhancement Plan (QEP) called Compass, Sul Ross aims to equip you to navigate excellence in the 21st century by developing your communication skills across multiple courses. This mathematics course is designed to enhance your communication skills. Therefore, this course has the following QEP Student Learning Outcome:

QEP Student Learning Outcome

The student will create works that exhibit skill in prepared and purposeful communication (written, oral, or visual).

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.*