

# MATH 3308: Survey of Basic Mathematical Theory I

Sul Ross State University Rio Grande College

Spring 2020

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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>

**Class Time** Monday and Wednesday, 9:30 – 10:45

**Class Location** Del Rio 107; Eagle Pass B112; Uvalde B114

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

**Office Hours** M 11:00 – 2:00, T 3:30 – 4:30 (EP), W 11:00 – 2:00, Th 12:00 – 2:00

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## Course Policies

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### Attendance Policy

Attendance is mandatory. **You may be dropped from the course if you accumulate nine absences**, in accordance with University policy. Two class periods amount to three absences. Arriving in class late or leaving early may be counted as an 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.

### Communication

The Blackboard system will be used to provide course materials and post grades. You are welcome to e-mail or call me at any time. Please make sure to check the e-mail address associated with Blackboard on a regular basis. You are also welcome to come to my office hours if you need help with the homework or wish to speak about your progress in the course.

### 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.

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	February 19
Exam 2	April 1

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 4, from 9:00 – 11:45. The final exam will be comprehensive.

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## Subject Outline

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

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## Schedule

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

Unit I	January 13 – February 3
Unit II	February 3 – 17
<b>Exam 1</b>	<b>February 19</b>
Unit III	February 25 – March 30
<i>Spring Break</i>	<i>March 9 – 13</i>
<b>Exam 2</b>	<b>April 1</b>
Unit IV	April 6 – 15
Unit V	April 15 – 29
<b>Final Exam</b>	<b>May 4</b>

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## University Statements

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**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.*