

## **Midland College Syllabus**

2021 - 2022

MATH 1350

Mathematics for Teachers I

3 Semester Credit Hours

(3 Lecture/0 Lab)

### **Instructor Information:**

Instructor: [Click here to enter text.](#)

Phone: [Click here to enter text.](#)

Office Hours: [Click here to enter text.](#)

Office: [Click here to enter text.](#)

Email : [Click here to enter text.](#)

**Notice:** Students MUST actively participate by completing an academic assignment required by the instructor by the official census date. Students who do not actively participate in an academically-related activity may be reported as never attended and dropped from the course.

### **Course Description:**

This course is intended to build or reinforce a foundation in fundamental mathematics concepts and skills. It includes the conceptual development of the following: sets, functions, numeration systems, number theory, and properties of the various number systems with an emphasis on problem solving and critical thinking. Prerequisite: A C or better in MATH 1314 (College Algebra) or 1414.

### **Text, References and Supplies:**

- Mathematical Reasoning for Elementary School Teachers, 7th ed., Pearson/Addison/Wesley. (MyMathLab with Pearson eText.)
- 978-0-134-76675-1
- Computer access
- Scientific calculator

### **Student Learning Outcomes**

After successfully completing this course the students should be able to:

1. Explain and model the arithmetic operations for whole numbers and integers.
2. Explain and model computations with fractions, decimals, ratios, and percentages.
3. Describe and demonstrate how factors, multiples, and prime numbers are used to solve problems.
4. Apply problem solving skills to numerical applications.
5. Represent and describe relationships among sets using the appropriate mathematical terminology and notation.
6. Compare and contrast structures of numeration systems.

**Student Contributions, Responsibilities and Class Policies:**

Students will be expected to comply with the policies outlined in the [Midland College Catalog](#). Instructor policies concerning attendance and academic behavior are consistent with the policies in the catalog. Regular attendance is required to do well in this class. Students will be evaluated based on the results of assessments outlined in the syllabus and Instructor Handout.

**Attendance Policy:**

It is the responsibility of the students to know the policies and procedures associated with absences. These policies are set by instructors. Excused absences may include, but are not limited to, illness, severe weather, and death in the family. Instructors will determine whether or not an absence is excused. Please visit the [Midland College Catalog](#)

**Withdrawal Policy:**

Students who have enrolled in a Texas public institution of higher education as a first-time freshman in fall 2007 or later are permitted to drop no more than six courses during the entire undergraduate career. This limit includes all transfer work taken at a Texas institution of higher education and to second baccalaureate degrees. This statute was enacted by the State of Texas in spring 2007 (Texas Education Code 51.907). Any course that a student drops after Census Day is counted toward the six-course limit if "(1) the student was able to drop the course without receiving a grade or incurring an academic penalty; (2) the student's transcript indicates or will indicate that the student was enrolled in the course; and (3) the student is not dropping the course in order to withdraw from the institution." Please visit the [Midland College Catalog](#)

**Scholastic Dishonesty:**

Midland College does not tolerate scholastic dishonesty or academic misconduct in any form. Please read the Student Rights & Responsibilities section in the [Midland College Catalog](#) for more information.

**Evaluation of Students:**

Students will be evaluated based on grades which may including the following but are not limited to:

**To Earn a D in this Course**

To earn a D in this course, you must master all of the following outcomes:

- Use Venn diagrams to compare and contrast items in a set.
- Explain a mathematical concept by working an example using appropriate strategies and tools and communicating the solution or procedure orally or in writing.
- Describe the structure of the TEKS and identify standards that belong to each category.
- Perform set operations.

- Find and read mathematical standards and describe the skills that standards dictate that students must master.
- Select & use appropriate models and tools to demonstrate operations on rational numbers.
- Describe and apply the problem-solving process and communicate solutions.
- Apply the four Problem Solving Principles to solve numerical application problems and utilize common strategies.
- Describe and model positional numeration systems, including binary and base-10 systems.
- Select and use appropriate models and tools to solve problems involving percents.
- Describe the difference between a model and a strategy and use the terminology correctly.
- Describe the development of mathematical reasoning & evaluate a student's thinking.
- Select & use appropriate models and tools to demonstrate thinking.
- Use factors, multiples, and primes to solve problems.
- Determine the prime factorization & prime power factorization of numbers.
- Complete 5 labs and provide thoughtful, complete responses to the questions on the lab reports.

### **To Earn a C in this Course**

To earn a C in this course, you must master all of the following outcomes:

- All of the D-level outcomes.
- Solve application problems.
- Define & describe numeracy.
- Select & use non-traditional strategies to perform operations on rational numbers.
- Select & use non-traditional strategies to solve problems involving percents.
- Select & use non-traditional strategies to perform operations on integers.
- Use the standards and connections to higher-level mathematics to defend or denounce the use of an instructional resource, model, or strategy.
- Find factors and multiples of a number.
- Evaluate resources, including worksheets, textbook sections, and individual problems, to determine to what extent they provide appropriate instruction or practice or assess the standards.
- Connect the numbers in a division problem to the corresponding numbers in a multiplication problem and explain the relationship.
- Complete 6 labs and provide thoughtful, complete responses to the questions on the lab reports.

### **To Earn a B in this Course**

To earn a B in this course, you must master all of the following outcomes:

- All of the D-level outcomes.

- All of the C-level outcomes.
- Compare and contrast historical and current numeration systems.
- Use whole-number strategies to perform decimal operations and adjust for place-value.
- Use traditional algorithms to perform operations on rational numbers.
- Use traditional algorithms to solve problems involving percents.
- Use traditional algorithms to perform operations on integers.
- Write problem strings to develop strategies for arithmetic operations.
- Solve problems involving set operations.
- Explain the role of single-digit addition & multiplication facts in mathematics
- Connect rational numbers in one form to equivalent values in another form & use these relationships fluently to solve problems.
- Complete 7 labs and provide thoughtful, complete responses to the questions on the lab reports.

### **To Earn an A in this Course**

To earn an A in this course, you must master all of the following outcomes:

- All of the D-level outcomes.
- All of the C-level outcomes.
- All of the B-level outcomes.
- Utilize multiple interpretations of rational numbers, including part-whole comparison, measurement, operator, quotient, and ratio.
- Explain the importance of representation and describe why numerical relationships, not rote memorization, are inherent to mathematical thinking.
- Use questioning to teach a "student" a strategy.
- Identify and use properties of operations.
- Convert quantities between bases other than 10 or between base 10 and historical numeration systems or bases other than 10.
- Generate equivalent fractions and determine if two fractions are equivalent.
- Analyze student work to identify mistakes and provide feedback to address misconceptions.
- Complete 8 labs and provide thoughtful, complete responses to the questions on the lab reports.

### **Course Schedule:**

This class meets for 3 contact hours per week. For a tentative schedule of the class meetings and material to be covered during those meetings, please refer to the schedule distributed to each student on the first class meeting (See Instructor Handout).

### **Course Outline:**

From the text, select topics from chapters 1 through 6 will be covered. Approximate assignments from the text and computer assignments will be used to enhance concepts. In addition to the text material, students will participate in class activities designed to reinforce concepts, demonstrate potential classroom use,

enhance critical thinking, and use individual and collaborative learning to broaden mathematical foundation.

#### Thinking Critically

1. An Introduction to Problem Solving
2. Polya's Problem Solving Principles
3. More Problem-Solving Strategies
4. Algebra as a Problem-Solving Strategy
5. Additional Problem-Solving Strategy

#### Sets and Whole Numbers

- 2.1 Sets and Operations on Sets
- 2.2 Sets, Counting, and the Whole Numbers
- 2.3 Addition and Subtraction of Whole Numbers
- 2.4 Multiplication and Division of Whole Numbers

#### Numeration and Computation

- 3.1 Numeration Systems Past and Present
- 3.2 Algorithms for Adding and Subtracting Whole Numbers
- 3.3 Algorithms for Multiplication and Division of Whole Numbers
- 3.5 Nondecimal Positional Systems

#### Number Theory

- 4.1 Divisibility of Natural Numbers
- 4.2 Tests for Divisibility
- 4.3 Greatest Common Divisors and Least Common Multiples

#### Integers

- 5.1 Representation of Integers
- 5.2 Addition and Subtraction of Integers
- 5.3 Multiplication and Division of Integers

#### Fractions and Rational Numbers

- 6.1 The Basic Concepts of Fractions and Rational Numbers
- 6.2 Addition and Subtraction of Fractions

### **Non-Discrimination Statement**

Midland College does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities. The following individual has been designated to handle inquiries regarding the non-discrimination policies:

#### **Tana Baker**

Title IX Coordinator/Compliance Officer  
3600 N. Garfield, SSC 131  
Midland, Texas 79705  
(432) 685-4781  
[tbaker@midland.edu](mailto:tbaker@midland.edu)

For further information on notice of non-discrimination, visit the ED.gov Office of Civil Rights website, or call 1 (800) 421-3481.

**Americans with Disabilities Act (ADA) Statement:**

Midland College provides services for students with disabilities through Student Services. In order to receive accommodations, students must visit [www.midland.edu/accommodation](http://www.midland.edu/accommodation) and complete the Application for Accommodation Services located under the Apply for Accommodations tab. Services or accommodations are not automatic, each student must apply and be approved to receive them. All documentation submitted will be reviewed and a "Notice of Accommodations" letter will be sent to instructors outlining any reasonable accommodations.

**Math & Science Division Information:**

Division Office: AHSF 124 (432) 685-4561  
Division E-Mail: [mns@midland.edu](mailto:mns@midland.edu)  
Department Chair: Dr. Krista Cohlmlia (432) 685-4541  
Dean: Dr. Miranda Poage  
Secretary: Sarah Anderson  
Clerk: Liliana Orcutt

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