

**COLLIN COUNTY COMMUNITY COLLEGE
COURSE SYLLABUS**

COURSE NUMBER: Math 1350

COURSE TITLE: Fundamentals of Mathematics I

CREDIT HRS: 3 **LECTURE HRS:** 3 **LAB HRS:** 0 **CLN/REC HRS:** 0

ASSESSMENTS:

Prior to enrolling in this course, the student must demonstrate eligibility to enroll in the following: MATH 1316, MATH 1325, MATH 1350, or MATH 2373.

PREREQUISITE: Math 1314 or Math 1414

COREQUISITE: Math 1351

TEXTBOOK:

A Problem Solving Approach To Mathematics For Elementary School Teachers, 10th ed., by Rick Billstein, Shlomo Libeskind, and Johnny W. Lott 2010, Pearson Education.

SUPPLIES: Calculator with y^x , $\ln x$, e^x , and $\log x$ keys, or graphing calculator (optional)

COURSE DESCRIPTION:

Concepts of sets, functions, numeration systems, number theory, proportions, percents and properties of the natural numbers, integers, rational and real number systems with an emphasis on problem solving and critical thinking. This course is designed specifically for students who seek middle grade (4-8) teacher certification and includes the foundational math concepts taught at the middle grade Level.

COURSE MEASURABLE LEARNING OUTCOMES:

Upon completion of this course, the student should be able to do the following:

1. Systematically solve problems.
2. Perform and model operations on sets and subsets
3. Perform and model the 4 arithmetic operations on various number sets
4. Classify and manipulate functions and their graphs
5. Connect integers, fractions and decimals
6. Solve applications using percents, ratios, and proportions

COURSE REQUIREMENTS: Attending lectures, completing assignments, and completing exams.

COURSE FORMAT: Lecture and guided practice

METHOD OF EVALUATION:

A minimum of four written exams and a comprehensive final exam. Homework and/or quizzes may be used in place of one exam or in addition to exams. The weight of each of these components of evaluation will be specified in the individual instructor's addendum to this syllabus. All out-of-class course credit, including take-home exams, home assignments, service-learning, etc. may not exceed 25% of the total course grade; thus, at least 75% of a student's grade must consist of exams given in the class or testing center, and no student may retake any of these exams.

COURSE REPEAT POLICY: All students may repeat this course only once after receiving a grade, including W. For example students who have taken this course twice have to choose a different course to take after two trials.

ADA STATEMENT: It is the policy of Collin County Community College to provide reasonable and appropriate accommodations for individuals with documented disabilities. This college will adhere to all applicable federal and state laws, regulations, and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the responsibility of the student to contact the ACCESS office located in room G200 at the Spring Creek Campus (972)881-5898 or TDD (972)881-5950, in a timely manner if he/she desires to arrange for accommodations.

ATTENDANCE POLICY: Attendance is expected of all students. If a student is unable to attend it is his/her responsibility to contact the instructor to obtain assignments. Please see the schedule of classes for the last day to withdraw.

RELIGIOUS HOLY DAYS:

In accordance with section 51.911 of the Texas Education Code, the college will allow a student who is absent from class for the observance of a religious holy day to take an examination or complete an assignment scheduled for that day within a reasonable time. A copy of the state rules and procedures regarding holy days and the form for notification of absence from each class under this provision are available from the Admissions and Records Office.

ACADEMIC ETHICS:

The college may initiate disciplinary proceedings against a student accused of scholastic dishonesty. Scholastic dishonesty includes, but is not limited to, statements, acts, or omissions related to applications for enrollment or the award of a degree, and/or the submission of material as one's own work that is not one's own. Scholastic dishonesty may involve one or more of the following acts: cheating, plagiarism, collusion, and/or falsifying academic records.

Cheating is the willful giving or receiving of information in an unauthorized manner during an examination, illicitly obtaining examination questions in advance, using someone else's work for assignments as if it were one's own, copying computer disks or files, and any other dishonest means of attempting to fulfill the requirements of a course.

Plagiarism is the use of an author's words or ideas as if they were one's own without giving credit to the source, including, but not limited to, failure to acknowledge a direct quotation. Contact the Dean of Students at 972.881.5771 for the student disciplinary process and procedures or consult the CCCC Student Handbook.

SPECIFIC REQUIREMENTS/COURSE CONTENT:

The student will be responsible for knowing all definition and statements of theorems for each section outlined in the following modules.

Module 1: Sets, Whole Numbers, and Functions

The student will be able to:

1. Define a set
2. Describe a set using a list or set-builder notation
3. Determine if a set is well-defined
4. Define the empty set
5. Define equal and equivalent sets
6. Find the cardinal number of a set
7. Distinguish between a finite set and an infinite set
8. Define a subset
9. Systematically list all subsets of a set
10. Define the complement of a set
11. Perform operations on sets (intersection, union, complement)
12. Use Venn diagrams to perform set operations
13. Find the Cartesian product of two sets
14. Define the sets of natural numbers and whole numbers
15. Describe different models for the 4 arithmetic operations on whole numbers
16. Explain the properties of the 4 arithmetic operations on whole numbers
17. Write a whole number in expanded form with place values
18. Apply models to a real-life situation
19. Determine if a relation is a function
20. Define the domain and range of a function
21. Represent a function as a rule, machine, equation, arrow diagram, table, and set of ordered pairs
22. Define a variable
23. Graph a function
24. Interpret graphs of functions

Module 2: Numeration Systems and Whole-Number Computation

The student will be able to:

1. Describe different systems of numeration (Egyptian, Babylonian, Roman)
2. Write a number in expanded form
3. Perform arithmetic operations on numbers in bases other than base 10.

4. Perform different algorithms for the 4 arithmetic operations on whole numbers
5. Invent strategies for mental arithmetic
6. Invent strategies for estimating answers to arithmetic problems
7. Apply rounding techniques in estimating answers to arithmetic problems

Module 3: Integers and Number Theory

The student will be able to:

1. Define the set of integers
2. Describe different models for the 4 arithmetic operations on integers
3. Explain the properties of the 4 arithmetic operations on integers
4. Represent operations with integers on the number line
5. Apply the order of operations
6. Define absolute value
7. Explain the divisibility rules for 2, 3, 4, 5, 6, 8, 9, 10, 11
8. Create divisibility rules for other integers
9. Determine whether a natural number is prime or composite
10. Determine the number of divisors of a number
11. Find the prime factorization of a natural number
12. State the Fundamental Theorem of Arithmetic
13. Find the greatest common divisor (GCD) of two or three natural numbers using multiple methods
14. Find the least common multiple (LCM) of two or three natural numbers using multiple methods
15. Discover relationships between the GCD and LCM

Module 4: Rational Numbers as Fractions

The student will be able to:

1. Define the set of rational numbers
2. Determine if a rational number is proper or improper
3. Determine if two rational numbers are equivalent
4. Model rational numbers
5. Simplify a rational number
6. Create equivalent fractions
7. Discuss the denseness of the rational numbers
8. Find a fraction in between two other fractions using more than one method
9. Arrange a set of rational numbers in order from smallest to largest
10. Perform and explain the 4 arithmetic operations with rational numbers
11. Describe different models for the 4 arithmetic operations on integers
12. Convert between mixed numbers and improper fractions
13. Invent strategies for estimating answers to arithmetic problems involving fractions
14. Define exponentiation as repeated multiplication
15. Define negative exponents and use the properties of exponents
16. Define ratio and proportion
17. Use ratios and proportions to solve various application problems

18. Explore the connections between ratios, fractions, and proportions

Module 5: Decimals, Percents, and Real Numbers

The student will be able to:

1. Describe the connection between decimals, fractions, and percents
2. Write a decimal in words
3. Write a decimal in expanded form with place values
4. Perform and explain the 4 arithmetic operations with decimals
5. Express numbers in scientific notation
6. Round a decimal to the nearest given place value
7. Classify decimals as either repeating, terminating, or non-terminating
8. Write a repeating decimal as a rational number (in fractional form)
9. Arrange a set of decimals in order from smallest to largest
10. Define square roots
11. Perform applications involving the Pythagorean theorem
12. Define the set of irrational numbers
13. Define the set of real numbers
14. Classify a number as natural, whole, integer, rational, irrational, or real.
15. Define percent as a ratio
16. Use percents to solve application problems
17. Compute percent increase or decrease