CENTRAL TEXAS COLLEGE
SYLLABUS FOR DSMA 0304
FUNDAMENTALS OF MATHEMATICS

(This course is equivalent to DSMA 0400. This course is offered without the additional lab time)

Semester Hours Credit: 3

INSTRUCTOR: ________________________________

OFFICE HOURS: ________________________________

I. INTRODUCTION

Fundamentals of Mathematics is designed to help students make the transition from arithmetic to algebra. This course includes operations with fractions, decimals and sign numbers; order of operations, prime factorization, greatest common factor, variable expressions, and solving equations. This course will assist the student in developing the critical-thinking and problem-solving skills necessary for other developmental or college-level courses.

This course is required for students who have not achieved a passing score on the TSI Assessment. Successful completion of this course fulfills the prerequisite for the next higher developmental or college-level mathematics course. This course has no prerequisite.

II. LEARNING OUTCOMES

Upon successful completion of this course, Fundamentals of Mathematics, the student will:

A. Use the available electronic instructional media, to reinforce and supplement classroom instruction. (F1, F2, F3, F4, F6)
B. Perform basic operations of addition, subtraction, multiplication and division of whole numbers, fractions, decimals and signed numbers. (F1, F3, F4, F5, F8)
C. Solve equations. (This is the number one objective of this course.) (F1, F3, F4, F5)
D. Analyze and solve formulas used in perimeter, area, volume and percent. (F1, F3, F4, F5)
E. Demonstrate critical-thinking and problem-solving skills applicable to the material of this course. (F1, F3, F4, F5, F8)
III. INSTRUCTIONAL MATERIALS/RESOURCES

To assist in this course, a variety of materials both in and out of the classroom will be required and used. The instructional materials identified for this course are viewable through:

www.ctcd.edu/books

Students will be allowed to use the basic calculator: Casio fx-55 PLUS

IV. COURSE REQUIREMENTS

A. Assignments will be made daily, and each assignment must be completed by the next class session. Assignments may be collected and examined at any time, and the instructor may require students to keep a notebook of completed assignments.

B. Completion of all assignments is required for a student to be eligible to take the final examination and to achieve a passing grade in this course.

V. EXAMINATIONS AND ASSIGNMENTS

CHALLENGE EXAMS

Mathematics students may be eligible, during the first week of the semester, to challenge the classes in which they are enrolled. Students must discuss the challenge procedures with their instructors to determine eligibility. If eligible to take the exam, a student will receive a signed challenge exam request form from the instructor. The challenge exam must be taken during the first week of classes.

A. Periodic examinations will be given during the course in order to evaluate a student's progress. A comprehensive final will be given.

Failure to take the final examination for the course will result in a grade of zero (0) to be posted for that examination. Students may not "retake" any exam. No "early" finals, take-home or open-book examinations will be administered. No examination grades will be dropped.

B. If you miss an exam, and have an excused absence, your instructor will arrange a make-up at his/her discretion. Said make-up may involve counting the next exam as a 200 point exam.
If you miss an exam, and do not have an excused absence then a make-up exam will be granted only at the discretion of the instructor. The make-up exam, if granted, will be given by appointment only.

C. If the student is absent from class, it is his or her responsibility to contact his or her classmate/instructor to determine missed instruction. Each student must make appropriate arrangements to acquire assignments, announcements, lecture notes, and other pertinent information missed.

D. Class exams will be returned to students within three class periods after the exam is administered.

VI. SEMESTER GRADE COMPUTATION

To receive a passing grade of “A,” “B,” or “C” in this course, each student must complete all requirements and assignments, and earn a weighted average of 70% or above derived from the periodic/unit examinations, homework, and the comprehensive final examination. The periodic/unit examinations will determine 35%, homework will determine 15% and the final examination will determine 50% of the final average.

Final grades will follow the grade designation for developmental courses below:

- “A” – Weighted average of 90 – 100%
- “B” - Weighted average of 80 – 90%
- “C” - Weighted average of 70 – 79%
- “D” – Weighted average of 60 – 69%
- “F” – Weighted average of 0 – 59%
- “W” - Withdrawal from course (initiated by student)

Students may receive their grades through:

The CTC WebAdvisor (Online) System. Instructions for using the WebAdvisor (online) Registrations and Grades by computer are listed in the schedule bulletin.

Grades will not be posted.

VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM THE INSTRUCTOR

A. Withdrawal from Course: It is the student's responsibility to officially withdraw from a class if circumstances prevent attendance. Any student who desires to, or must, officially withdraw from a course after the first scheduled class meeting must file an Application for Withdrawal or Application for Refund. The withdrawal form must be signed by the student.
An Application for Withdrawal will be accepted at any time prior to Friday of the 12th week of classes during the 16-week fall and spring semesters. The deadline for sessions of other lengths is as follows:

- **12 week session**: Friday of the 9th week
- **10 week session**: Friday of the 7th week
- **8 week session**: Friday of the 6th week
- **6 week session**: Friday of the 4th week
- **5 week session**: Friday of the 3rd week

The equivalent date (75% of the semester) will be used for sessions of other lengths. The specific last day to withdraw is published each semester in the schedule bulletin.

Students who officially withdraw will receive a "W" if their academic performance is satisfactory at the time of official withdrawal. Students must file a withdrawal application with the college before they may be considered for withdrawal.

Before withdrawing from any developmental course, the student should seek the advice of Guidance and Counseling so that the student does not initiate an action that would inadvertently have negative repercussions on his/her enrollment or Financial Aid.

**B. Cellular Phones and Pagers:** Cellular phones and pagers must be turned off and put away while the student is in the classroom.

**C. American's with Disabilities Act (ADA):** Disability Support Services provides services to students who have appropriate documentation of a disability. Students requiring accommodations for class are responsible for contacting the Office of Disability Support Services (DSS) located on the central campus. This service is available to all students, regardless of location. Review the website at [www.ctcd.edu/disability-support](http://www.ctcd.edu/disability-support) for further information. Reasonable accommodations will be given in accordance with the federal and state laws through the DSS office.

**D. Civility:** Individuals are expected to be cognizant of what a constructive educational experience is and respectful of those participating in a learning environment. Failure to do so can result in disciplinary action up to and including expulsion.

**E. Office Hours:** Full-time instructors post their office hours outside their office doors. Part-time instructors may be available by appointment. Please feel free to see your instructor should you find yourself having difficulty with this course.
VIII. COURSE OUTLINE

A. Unit One: (Chapter One) The Whole Numbers
1. Unit Objectives: Upon successful completion of this unit the student will be able to:
   a. Practice tips for success in mathematics.
   b. Identify the place value of a digit in a whole number.
   c. Write a whole number in words and in standard form.
   d. Write a whole number in expanded form.
   e. Interpret tables.
   f. Demonstrate ability to add whole numbers.
   g. Demonstrate ability to subtract whole numbers.
   h. Calculate the perimeter of a polygon.
   i. Solve problems by adding or subtracting whole numbers.
   j. Demonstrate ability to round whole numbers.
   k. Estimate sums and differences.
   l. Solve problems by estimating.
   m. Apply the properties of multiplication.
   n. Demonstrate ability to multiply whole numbers.
   o. Calculate the area of a rectangle.
   p. Solve problems by multiplying whole numbers.
   q. Demonstrate ability to divide whole numbers.
   r. Demonstrate ability to perform long division.
   s. Solve problems that require dividing by whole numbers.
   t. Calculate the average of a list of numbers.
   u. Write repeated factors using exponential notation.
   v. Evaluate expressions containing exponents.
   w. Apply the order of operations.
   x. Calculate the area of a square.
   y. Evaluate algebraic expressions given replacement values.
   z. Identify solutions of equations.
   aa. Translate phrases into variable expressions.

2. Learning Activities:
   a. Classroom lecture/discussion (F5, F6, F7, F8)
   b. Reading/homework assignments (F1, F2, F7, F8, F9, F10, F11, F12)
   c. Computer Laboratory/Computer Tutor (F2, F7, F8, F9, F10, F11, F12)

3. Unit Outline:
   a. Section 1.1 Study Skills Tips for Success in Mathematics
   b. Section 1.2 Place Value, Names for Numbers, and Reading Tables
   c. Section 1.3 Adding and Subtracting Whole Numbers, and Perimeter
   d. Section 1.4 Rounding and Estimating
   e. Section 1.5 Multiplying Whole Numbers and Area
   f. Section 1.6 Dividing Whole Numbers
Section 1.7 Exponents and Order of Operations

Section 1.8 Introduction to Variables, Algebraic Expressions, and Equations

B. Unit Two: (Chapter Two) **Integers and Introduction to Solving Equations**

1. **Unit Objectives:** Upon successful completion of this unit the student will be able to:
   a. Interpret real-life situations with integers.
   b. Compose a number line containing integers.
   c. Compare integers.
   d. Determine the absolute value of a number.
   e. Determine the opposite of a number.
   f. Interpret bar graphs containing integers.
   g. Demonstrate ability to add integers.
   h. Evaluate an algebraic expression by adding.
   i. Solve problems by adding integers.
   j. Demonstrate ability to subtract integers.
   k. Demonstrate ability to add and subtract integers.
   l. Evaluate an algebraic expression by subtracting.
   m. Solve problems by subtracting integers.
   n. Demonstrate ability to multiply integers.
   o. Demonstrate ability to divide integers.
   p. Evaluate an algebraic expression by multiplying or dividing.
   q. Solve problems by multiplying or dividing integers.
   r. Demonstrate ability to simplify expressions by using the order of operations.
   s. Evaluate an algebraic expression.
   t. Calculate the average of a list of numbers.
   u. Identify solutions of equations.
   v. Apply the addition property of equality to solve equations.
   w. Apply the multiplication property of equality to solve equations.

2. **Learning Activities:**
   a. Classroom lecture/discussion (F5, F6, F7, F8)
   b. Reading/homework assignments (F1, F2, F7, F8, F9, F10, F11, F12)
   c. Computer Laboratory/Computer Tutor (F2, F7, F8, F9, F10, F11, F12)

3. **Unit Outline:**
   a. Section 2.1 Introduction to Integers
   b. Section 2.2 Adding Integers
   c. Section 2.3 Subtracting Integers
   d. Section 2.4 Multiplying and Dividing Integers
   e. Section 2.5 Order of Operations
   f. Section 2.6 Solving Equations: The Addition and Multiplication Properties

C. **Unit Three:** (Chapter Three) **Solving Equations and Problem Solving**
1. **Unit Objectives:** Upon successful completion of this unit the student will be able to:
   a. Apply properties of numbers to combine like terms.
   b. Apply properties of numbers to multiply expressions.
   c. Demonstrate ability to simplify expressions by multiplying and then combining like terms.
   d. Calculate the perimeter and area of figures.
   e. Apply the addition property or the multiplication property to solve equations.
   f. Apply both addition and multiplication properties to solve equations.
   g. Translate word phrases into mathematical expressions.
   h. Solve linear equations using the addition and multiplication properties.
   i. Solve linear equations containing parentheses.
   j. Write numerical sentences as equations.
   k. Write sentences as equations.
   l. Apply problem-solving steps to solve problems.

2. **Learning Activities:**
   a. Classroom lecture/discussion (F5, F6, F7, F8)
   b. Reading/homework assignments (F1, F2, F7, F8, F9, F10, F11, F12)
   c. Computer Laboratory/Computer Tutor (F2, F7, F8, F9, F10, F11, F12)

3. **Unit Outline:**
   a. Section 3.1 Simplifying Algebraic Expressions
   b. Section 3.2 Solving Equations: Review of the Addition and Multiplication Properties
   c. Section 3.3 Solving Linear Equations in One Variable
   d. Section 3.4 Linear Equations in One Variable and Problem Solving

D. **Unit Four:** (Chapter Four) **Fractions and Mixed Numbers**

1. **Unit Objectives:** Upon successful completion of this unit the student will be able to:
   a. Identify the numerator and the denominator of a fraction.
   b. Write a fraction to represent parts of figures or real-life data.
   c. Compose a number line containing fractions.
   d. Review division properties of 0 and 1.
   e. Write mixed numbers as improper fractions.
   f. Write improper fractions as mixed numbers or whole numbers.
   g. Write a number as a product of prime numbers.
   h. Write a fraction in simplest form.
   i. Formulate whether two fractions are equivalent.
   j. Solve problems by writing fractions in simplest form.
   k. Demonstrate ability to multiply fractions.
   l. Evaluate exponential expressions with fractional bases.
m. Demonstrate ability to divide fractions.

n. Demonstrate ability to multiply and divide given fractional replacement values.

o. Solve applications that require multiplication of fractions.

p. Demonstrate ability to add or subtract like fractions.

q. Demonstrate ability to add and subtract given fractional replacement values.

r. Solve problems by adding or subtracting like fractions.

s. Determine the least common denominator of a list of fractions.

t. Write equivalent fractions.

u. Demonstrate ability to add and subtract unlike fractions.

t. Write fractions in order.

w. Evaluate expressions given fractional replacement values.

x. Solve problems by adding or subtracting unlike fractions.

y. Demonstrate ability to simplify complex fractions.

z. Review the order of operations.

aa. Evaluate expressions given replacement values.

bb. Compose a number line containing positive and negative fractions and mixed numbers.

c. Demonstrate ability to multiply or divide mixed numbers or whole numbers.

d. Demonstrate ability to add or subtract mixed numbers.

e. Solve problems containing mixed numbers.

ff. Demonstrate ability to perform the order of operations on negative mixed numbers.

gg. Solve equations containing fractions.

hh. Solve equations by multiplying by the LCD.

ii. Review adding and subtracting fractions.

2. Learning Activities:

a. Classroom lecture/discussion (F5, F6, F7, F8)

b. Reading/homework assignments (F1, F2, F7, F8, F9, F10, F11, F12)

c. Computer Laboratory/Computer Tutor (F2, F7, F8, F9, F10, F11, F12)

3. Unit Outline:

a. Section 4.1 Introduction to Fractions and Mixed Numbers

b. Section 4.2 Factors and Simplest Form

c. Section 4.3 Multiplying and Dividing Fractions

d. Section 4.4 Adding and Subtracting Like Fractions, Least Common Denominator, and Equivalent Fractions

e. Section 4.5 Adding and Subtracting Unlike Fractions

f. Section 4.6 Complex Fractions and Review of Order of Operations

g. Section 4.7 Operations on Mixed Numbers

h. Section 4.8 Solving Equations Containing Fractions

E. Unit Five: (Chapter Five) Decimals
1. **Unit Objectives:** Upon successful completion of this unit the student will be able to:
   a. Recall the place value for decimal numbers, and write decimals in words.
   b. Write decimals in standard form.
   c. Write decimals as fractions.
   d. Compare decimals.
   e. Demonstrate ability to round decimals to a given place value.
   f. Demonstrate ability to add or subtract decimals.
   g. Estimate when adding or subtracting decimals.
   h. Evaluate expressions with decimal replacement values.
   i. Demonstrate ability to simplify expressions containing decimals.
   j. Solve problems that involve adding or subtracting decimals.
   k. Demonstrate ability to multiply decimals.
   l. Estimate when multiplying decimals.
   m. Demonstrate ability to multiply decimals by powers of 10.
   n. Evaluate expressions with decimal replacement values.
   o. Calculate the circumference of a circle.
   p. Solve problems by multiplying decimals.
   q. Demonstrate ability to divide decimals.
   r. Estimate when dividing decimals.
   s. Demonstrate ability to divide decimals by powers of 10.
   t. Evaluate expressions with decimal replacement values.
   u. Solve problems by dividing decimals.
   v. Write fractions as decimals.
   w. Compare fractions and decimals.
   x. Demonstrate ability to simplify expressions containing decimals and fractions by using order of operations.
   y. Solve area problems containing fractions and decimals.
   z. Evaluate expressions given decimal replacement values.
   aa. Solve equations containing decimals.
   bb. Calculate the mean of a list of numbers.
   cc. Calculate the median of a list of numbers.
   dd. Calculate the mode of a list of numbers.

2. **Learning Activities:**
   a. Classroom lecture/discussion (F5, F6, F7, F8)
   b. Reading/homework assignments (F1, F2, F7, F8, F9, F10, F11, F12)
   c. Computer Laboratory/Computer Tutor (F2, F7, F8, F9, F10, F11, F12)

3. **Unit Outline:**
   a. Section 5.1 Introduction to Decimals
   b. Section 5.2 Adding and Subtracting Decimals
   c. Section 5.3 Multiplying Decimals and Circumference of a Circle
   d. Section 5.4 Dividing Decimals
F. Unit Six: (Chapter Six) **Ratio, Proportion, and Percent**
   1. **Unit Objectives:** Upon successful completion of this unit the student will be able to:
      a. Write ratios as fractions.
      b. Solve Proportions
      c. Solve Problems Modeled by Proportions
      d. Define Percent
      e. Write Percents as Decimals or Fractions
      f. Write Decimals or Fractions as Percents
      g. Solve applications problems with Percents, Decimals, and Fractions
      h. Write Percent Problems as Equations
      i. Write Percent Problems as Proportions
      j. Solve Percent Problems
      k. Solve Applications Involving Percent
      l. Calculate Percent Increase and Percent Decrease
      m. Calculate Sales Tax and Total Price
      n. Calculate Commission
      o. Calculate Discount and Sale Price
      p. Calculate Simple Interest
      q. Calculate Compound Interest

   2. **Learning Activities:**
      a. Classroom lecture/discussion (F5, F6, F7, F8)
      b. Reading/homework assignments (F1, F2, F7, F8, F9, F10, F11, F12)
      c. Computer Laboratory/Computer Tutor (F2, F7, F8, F9, F10, F11, F12)

   3. **Unit Outline:**
      a. Section 6.1 Ratios and Proportion
      b. Section 6.2 Percents, Decimals, and Fractions
      c. Section 6.3 Solving Percent Problems with Equations
      d. Section 6.4 Solving Percent Problems with Proportions
      e. Section 6.5 Applications of Percent
      f. Section 6.6 Percent and Problem Solving: Sales Tax, Commission, and Discount.
      g. Section 6.7 Percent and Problem Solving: Interest

G. Unit Seven: (Chapter Seven) **Graphs and Triangle Applications**
   1. **Unit Objectives:** Upon successful completion of this unit the student will be able to:
      a. Interpret Pictographs
      b. Interpret and Construct Bar Graphs
c. Interpret and Construct Histograms

d. Interpret Line Graphs

e. Interpret Circle Graphs

f. Construct Circle Graphs

g. Calculate the Square Root of a Number

h. Demonstrate ability to approximate Square Roots

i. Employ the Pythagorean Theorem.

j. Formulate Whether Two Triangles are Congruent

k. Calculate the Ratio of Corresponding Side in Similar Triangles

l. Calculate the Unknown Lengths of Sides in Similar Triangles

m. Employ a Tree Diagram to Count Outcomes

n. Calculate the Probability of an Event

2. **Learning Activities:**

a. Classroom lecture/discussion (F5, F6, F7, F8)

b. Reading/homework assignments (F1, F2, F7, F8, F9, F10, F11, F12)

c. Computer Laboratory/Computer Tutor (F2, F7, F8, F9, F10, F11, F12)

3. **Unit Outline:**

a. Section 7.1 Reading Pictographs, Bar Graphs, Histograms and Line Graphs.

b. Section 7.2 Reading and Drawing Circle Graphs

c. Section 7.3 Square Roots and Pythagorean Theorem

d. Section 7.4 Congruent and Similar Triangles

e. Section 7.5 Counting and Introduction to Probability.