TAFT COLLEGE
West Kern Community College District

Mathematics (MATH) 0230 Basic Mathematics (5 Units)
[formerly Mathematics 57]

Prerequisite: None

Total Hours: 80 hours lecture

Catalog Description: This course is designed to teach and reinforce basic proficiency in the basic ideas and skills of arithmetic. The course also presents topics needed by the student for further work in mathematics, as well as everyday life.

Type of Class/Course: Non-degree credit

Text: Lial, Margaret L., and Stanley A. Salzman. *Basic College Mathematics*. 10th ed. Pearson, 2018.

Additional Instructional Materials: Videos for *Essential Mathematics*
                                        Student Solutions Manual for *Essential Mathematics*
                                        MyMathLab access password

Course Objectives:

By the end of the course, a successful student will be able to:

1.   Demonstrate proficiency in the basic skills of arithmetic by efficiently solving problems concerned with:
        a.   addition and subtraction of real numbers,
        b.   multiplication and division of real numbers,
        c.   multiplying and dividing fractions,
        d.   adding and subtracting fractions,
        e.   decimals,
        f.   ratio and proportion,
        g.   percent,

2.   Solve problems dealing with:
        a.   common mathematic applications in astronomy, auto mechanics, biology, business, chemistry, construction, demographics, domestic skills, economics, education, environmental science, finance, geometry, government, health, labor, social sciences, sports, entertainment, technology, and transportation,
        b.   consumer mathematics dealing with simple and compound interest, percent increase and decrease, taxes, and discounts.

Course Scope and Content:

Unit I   Whole Numbers

    A. Identify Whole Numbers,
    B. Read and write whole numbers,
    C. Add and subtract whole numbers,
    D. Solving application problems involving addition and subtraction,
    E. Perform multiplication upon whole numbers,
    F. Use shortcuts for multiplying numbers with zeros,
    G. Write division problems three ways,
    H. Determine divisibility by using the divisibility rules,
    I. Divide a number by short and long division,
    J. Solve application problems involving multiplication and division,
    K. Round numbers to estimate answers,
    L. Round numbers using front-end rounding,
    M. Identify an exponent and a base,
    N. Find the square root of a number, and
    O. Use the order of operations to simplify a numerical expression.

Unit II   Multiplying and Dividing Fractions

    A. Use a fraction to show which part of a whole is shaded or used,
    B. Identify the numerator and denominator of a fraction,
    C. Identify proper and improper fractions,
    D. Write mixed numbers as improper fractions,
    E. Write improper fractions as mixed numbers,
    F. Find all of the factors of a number,
    G. Find the prime factors of a number,
    H. Write a fraction in lowest terms by using common factors and prime factors,
    I. Show that two fractions are equivalent,
    J. Multiply fractions by fractions and whole numbers,
    K. Determine the area of a figure using fractional dimensions,
    L. Find the reciprocal of a fraction,
    M. Divide fractions,
    N. Add, subtract, multiply, and divide mixed numbers,
    O. Estimate the answer when using mixed numbers, and
    P. Solve application problems involving multiplying and dividing fractions and mixed numbers.

Unit III   Adding and Subtracting Fractions

    A. Identify like and unlike fractions,
    B. Find the least common multiple of a set of fractions using prime factors and multiples of the largest number,
    C. Find the least common multiple by using repeated division of prime numbers,
    D. Change a fraction to a new equivalent one with the indicated denominator,
    E. Add like and unlike fractions,
    F. Subtract like and unlike fractions,
    G. Add or subtract mixed numbers,
    H. Estimate the answers when adding or subtracting mixed numbers,

I. Identify the greater of two fractions,
J. Use exponents with fractions,
K. Use the order of operations to simplify fractional expressions, and
L. Solve word problems involving the addition or subtraction of fractions and mixed numbers.

Unit IV   Decimals

A. Identify the place value of a digit,
B. Read and write decimal numbers,
C. Write decimals as fractions and mixed numbers,
D. Round a decimal number to a pre-determined place value,
E. Round money amounts to the nearest cent or dollar,
F. Add and subtract decimal numbers,
G. Multiply and divide decimal numbers,
H. Estimate the answer when adding and subtracting decimal numbers,
I. Divide decimal numbers by whole numbers and decimal numbers,
J. Use the order of operations when working with decimals,
K. Write fractions as equivalent decimals,
L. Compare the size of fractions and decimals, and
M. Solve application problems involving operations with decimal numbers.

Unit V   Ratio and Proportion

A. Write ratios and rates in fraction, colon, and to forms
B. Solve ratio and rate problems involving whole numbers, fractions, and decimals
C. Convert from one unit to another
D. Find a unit rate and use unit rates to find the best buy
E. Write proportions and determine whether proportions are true or false
F. Find the cross products of proportions and use the cross products to find the unknown in a proportion
G. Use proportions to solve application problems including percents

Unit VI   Percents

A. Explain the meaning of percent,
B. Write percents in decimal, fraction form, and shift among these three forms when needed,
C. Find 1, 5,10,50, and 100% of a value using a shortcut,
D. From memory, give the percent equivalent of ½, 1/3, ¼, 1/5, 1/8, 1/9, and 1/10,
E. Use the percent proportion to solve percent applications,
F. Use the percent equation to solve percent problems,
G. Identify the elements of the percent proportion and equation, including the part, whole, and percent,
H. Solve application problems including sales tax, commissions, discounts, and percent change,
I. Find the simple interest on a loan, and
J. Find the total amount due on a loan.

Learning Activities Required Outside of Class:

The students in this class will spend a minimum of 10 hours per week outside of the regular class time

doing the following:

1. Studying
2. Skill practice
3. Completing assignments
4. Completing special projects as assigned by instructor

Methods of Instruction:

1. Lecture-demonstrations and simple problems solved by the instructor,
2. Occasional lab activities on the computer and/or calculator, and
3. Demonstrations and interactive lessons from the Internet.

Methods of Evaluation:

1. Computational or non-computational problem solving demonstrations including:
2. exams,
3. homework problems,
4. quizzes,
5. projects, and
6. final examination.