COURSE OUTLINE

MATH 099 – Fundamentals of Applied Mathematics

Prepared By:  Mathematics Department
A. **TITLE:** FUNDAMENTALS OF APPLIED MATHEMATICS

B. **COURSE NUMBER:** MATH 099

C. **CREDIT HOURS:** 3

D. **WRITING INTENSIVE COURSE:** No

E. **COURSE LENGTH:** 15 weeks

F. **SEMESTER(S) OFFERED:** Fall/Spring

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:** 3 hours of lecture weekly

H. **CATALOG DESCRIPTION:** This course connects mathematical concepts and procedures to real-life applications relevant to a variety of technical trade fields. Topics include: a review of fundamental arithmetic concepts, order of operations, measurement and conversions, ratio and proportion, signed numbers, exponents and radicals, estimation, and an introduction to algebra.

I. **PRE-REQUISITES/CO-COURSES:** For students with no algebra background or for those receiving less than 75 on the New York State Math A or Integrated Algebra Regents or equivalent examination, or permission of instructor.

J. **GOALS (STUDENT LEARNING OUTCOMES):**
   By the end of this course, the student will be able to:

   a. Perform calculations with whole numbers, fractions, decimals, and signed numbers with and without the aid of a calculator.
      i. Use estimation to determine the reasonableness of the answer
   
   b. Round the answer to a calculation using the “Rules of Accuracy”.
   
   c. Use Unity Fractions to:
      Perform basic conversions for length, weight and liquid capacity in the English system of units.
      i. Determine the correct unit in the answer of a trade word problem.
   
   d. Able to perform basic algebraic techniques by demonstrating the ability to:
      i. Solve two-step equations.
      ii. Manipulate simple formulas to solve for different variables within the formula.
e. Solve trade word problems by:
   i. Choosing the correct method to solve the problem, such as:
      i. Ratio and proportion
      ii. Area and perimeter
      iii. Formulas such as Ohm’s Law
      iv. Diagram
   ii. Organizing the solution to the problem by:
      i. Displaying work in a neat manner
      ii. Showing formulas used
      iii. Drawing a diagram (if appropriate)
      iv. Showing all necessary steps
      v. Rounding the answer using accuracy
      vi. Affixing the unit
   iii. Using estimation to determine the reasonableness of the answer

1. Communication
2. Critical Thinking


L. **REFERENCES:** NA

M. **EQUIPMENT:** A technology enhanced classroom.

N. **GRADING METHOD:** A - F

O. **MEASUREMENT CRITERIA/METHODS:**
   - Homework
   - Quizzes
   - Exams
   - Participation
   - Projects

P. **DETAILED COURSE OUTLINE:**

I. Review of Fundamental Arithmetic Concepts
   A. Operations with real numbers
   B. Prime factors
   C. Order of operations
   D. Equivalent fractions and writing in lowest terms
   E. Reciprocals
   F. Least common denominator
   G. Estimation and predictions
   H. Applications

II. Ratio, Proportion, and Percent
    A. Ratio and proportion
    B. Simple ratio and proportion equations
    C. Introduction to percent problems
    D. Converting percent to fractions and decimals and vice versa
    E. Applications of percent calculations
    F. Applications of ratio and proportion

III. Measurement
    A. Working with measurement numbers
    B. Accuracy
C. English units and unit conversion
D. Technical applications with measurement

IV. Pre-Algebra Topics
A. Operations with signed numbers
B. Absolute value
C. Exponents and square roots
D. Order of operations with exponents
E. Scientific notation and powers of 10

V. Basic Algebra
A. Algebraic language and formulas
B. Algebraic expressions
C. Evaluating formulas
D. Solve simple equations
E. Solve simple 2-step equations
F. Manipulate simple formulas
G. Applications

VI. Practical Plane Geometry
A. Labeling, measuring, classifying, and drawing angles
B. Area and perimeter of polygons
C. Applications

Q. LABORATORY OUTLINE: NA