Course Outline for MATH 72D

TECHNICAL ELEMENTARY ALGEBRA D

Effective: Fall 2018

I. CATALOG DESCRIPTION:
   MATH 72D — TECHNICAL ELEMENTARY ALGEBRA D — 1.00 units

   This course provides a survey of computational and elementary algebraic processes with an emphasis on applications in the automotive and welding trades. Topics covered include, but are not limited to: the rectangular coordinate system, linear equations in two variables, and systems of linear equations. This course cannot be used as a prerequisite for Math 50 Core Intermediate Algebra or Math 55 Intermediate Algebra.

   1.00 Units Lecture

   Prerequisite
   MATH 72B - Technical Elementary Algebra B
   with a minimum grade of C
   and

   MATH 72C - Technical Elementary Algebra C
   with a minimum grade of C

   Grading Methods:
   Letter or P/NP

   Discipline:
   • Mathematics

	MIN
Lecture Hours:	18.00
Expected Outside of Class Hours:	36.00
Total Hours:	54.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:
   Before entering the course a student should be able to:

   A. MATH72B
      1. Evaluate and simplify formulas and algebraic expressions;
      2. Perform operations with algebraic expressions;
      3. Solve linear equations in one variable;
      4. Solve a formula for a specified variable;
      5. Graph linear equations in two variables using various methods;
      6. Solve applied problems using linear equations.
   B. MATH72C
      1. Perform computations with decimal numbers to a specified number of significant digits;
      2. Solve applied problems involving percentages;
      3. Solve problems using U.S. customary units and metric units of length, area, volume, mass, temperature, and time;
      4. Perform conversion of measurements within the U.S. or metric systems and between the U.S. and metric systems;
      5. Use measuring instruments with accuracy;
      6. Solve applied problems using percentages and systems of measurement.

IV. MEASURABLE OBJECTIVES:
   Upon completion of this course, the student should be able to:

   A. Apply concepts of slopes and rates of change
   B. Write equations of lines
   C. Develop and describe basic linear models
   D. Solve systems of linear equations in two variables by graphing
   E. Solve systems of linear equations in two variables by either the elimination or the substitution methods
   F. Solve applied problems using a variety of techniques including proportions, percentages, linear equations or systems of linear equations

V. CONTENT:
- A. Linear equations in two variables
    1. Review of graphing linear equations in two variables
        - a. Tables of solutions
        - b. Intercepts
        - c. Horizontal and vertical lines
    2. Slope
        - a. Slope formula
        - b. Rates of Change
        - c. Slopes of parallel and perpendicular lines
        - d. Slopes of horizontal and vertical lines
    3. Equations of lines
        - a. Slope-intercept form
        - b. Modeling with linear data
    4. Technical applications
- B. Systems of linear equations in two variables
    1. Types of solutions and solution terminology
    2. Methods of Solution
        - a. Graphical
        - b. Substitution
        - c. Elimination
    3. Technical applications

VI. METHODS OF INSTRUCTION:
- A. Assigned reading with questions to be answered in writing.
- B. Homework
- C. **Lecture** -
- D. **Classroom Activity** - Collaborative learning activities
- E. **Audio-visual Activity** - web-based and/or videos embedded in an eText.

VII. TYPICAL ASSIGNMENTS:
- A. Homework
    1. Problems from the text should be assigned for each section covered. The number of problems assigned may vary from section to section and from instructor to instructor, but the homework assignments should include a sufficient number and variety of problems to develop both skill and conceptual understanding. A typical assignment should take an average student 1 to 2 hours for each hour in class.
    2. The majority of the problems assigned should be those for which answers are readily available so that students may obtain immediate feedback on their work.
    3. Homework assignments may include reading the text or viewing tutorial videos. An instructor may require written work in conjunction with such assignments (e.g., have students complete a Q & A sheet related to the assigned reading or tutorial).
- B. Classroom Activity
    1. Collaborative learning, done in small groups of 2-4 students, can be used to introduce new concepts, build skills, or teach problem solving.
    2. Sample Collaborative learning assignment: Students practice measuring a variety of objects and answer questions about precision and accuracy. Students work together to solve applied problems by writing and solving systems of linear equations.

VIII. EVALUATION:
- A. **Methods**

    1. Exams/Tests
    2. Quizzes
    3. Class Work
    4. Home Work
- B. **Frequency**

    1. Recommend a minimum of one exam plus the final
    2. Homework should be assigned for each section covered
    3. Number of quizzes and class work activities are at the discretion of the instructor

IX. TYPICAL TEXTS:
1. Carman, Robert, and Hal Saunders. *Mathematics for the Trades.* tenth ed., Pearson, 2015.
2. Peterson, John, and Robert Smith. *Introductory Technical Mathematics.* seventh ed., Cengage, 2019.
3. Ewan, Dale. *Elementary Technical Mathematics.* twelfth ed., Cengage, 2019.

X. OTHER MATERIALS REQUIRED OF STUDENTS:
- A. Scientific Calculator
- B. 12-inch ruler with both American customary units and metric units