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Course Outline for MATH 52A

TECHNICAL INTERMEDIATE ALGEBRA FOR AUTOMOTIVE TECHNOLOGY A

Effective: Fall 2018

I. CATALOG DESCRIPTION:

MATH 52A — TECHNICAL INTERMEDIATE ALGEBRA FOR AUTOMOTIVE TECHNOLOGY A — 1.50 units

This course provides a survey of algebraic processes with an emphasis on applications in the automotive trades. Topics covered include, but are not limited to: algebraic expressions; quadratic functions; and functions. This course may not be used as a prerequisite for any transfer level course.

1.50 Units Lecture

Prerequisite

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

Grading Methods:

Letter or P/NP

Discipline:

- Mathematics

	<u>MIN</u>
Lecture Hours:	27.00
Expected Outside of Class Hours:	54.00
Total Hours:	81.00

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. MATH72D

1. Apply concepts of slopes and rates of change
2. Write equations of lines
3. Develop and describe basic linear models
4. Solve systems of linear equations in two variables by graphing
5. Solve systems of linear equations in two variables by either the elimination or the substitution methods
6. Solve applied problems using a variety of techniques including proportions, percentages, linear equations or systems of linear equations

IV. MEASURABLE OBJECTIVES:

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

- A. Evaluate and simplify formulas and algebraic expressions;
- B. Perform operations with algebraic expressions;
- C. Simplify expressions with exponents;
- D. Solve literal equations;
- E. Apply principles of scientific notation;
- F. Solve quadratic equations;
- G. Use function notation appropriately;
- H. Determine the domain and range of a function;
- I. Solve applied problems utilizing linear, quadratic or exponential functions.

V. CONTENT:

- A. Algebraic expressions
 1. Algebraic terminology
 2. Operations with algebraic expressions
 - a. Addition and subtraction (review)
 - b. Multiplication and division
 - c. Laws of exponents
 3. Formulas

- a. Evaluation
 - b. Solving a literal equation
- 4. Technical applications
- B. Scientific notation
 - 1. Interpreting and understanding scientific notation
 - 2. Converting between decimal form and scientific notation
 - 3. Computations in scientific notation
 - 4. Technical applications
- C. Solving quadratic equations
 - 1. Method of square roots
 - 2. Quadratic formula
 - 3. Technical applications
- D. Introduction to functions
 - 1. Definition
 - 2. Multiple representations of functions
 - 3. Identifying a function
 - 4. Domain and range
 - 5. Evaluation of functions
 - 6. Technical applications: problem solving with functions
 - a. Linear functions
 - b. Quadratic functions
 - c. Exponential functions

VI. METHODS OF INSTRUCTION:

- A. **Audio-visual Activity** - Web-based and/or videos embedded in an e-text.
- B. **Classroom Activity** - Collaborative learning activities
- C. Homework.
- D. Assigned readings with questions to be answered in writing.
- E. **Lecture** -

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. In-Class Activities
 - 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 explore the differences between linear, quadratic and exponential growth by developing graphical numerical representations of these three functions. They create linear and exponential models showing the growth of money over time and determine which model will yield the most money.

VIII. EVALUATION:

- A. **Methods**
 - 1. Exams/Tests
 - 2. Quizzes
 - 3. Home Work
 - 4. Other:
 - a. Collaborative group activities in class
- B. **Frequency**
 - 1. Recommend a minimum of two exams plus the final exam
 - 2. Homework should be assigned for each section covered
 - 3. The number of quizzes and collaborative activities are at the discretion of the instructor

IX. TYPICAL TEXTS:

- 1. Carman, Robert, and Hal Saunders. *Mathematics for the Trades*. 10th ed., Pearson Higher Education, Inc., 2015.
- 2. Ewan, Dale. *Elementary Technical Mathematics*. 11th ed., Cengage, 2015.
- 3. Peterson, John, and Robert Smith. *Introductory Technical Mathematics*. 6th ed., Pearson Higher Education, Inc., 2013.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

- A. Scientific calculator