COURSE OUTLINE

MATH 135 - TECHNICAL MATH I

Prepared By: Patrick Casselman and Frederick Saburro
A. **TITLE**: TECHNICAL MATH I

B. **COURSE NUMBER**: MATH 135

C. **CREDIT HOURS**: 4

D. **WRITING INTENSIVE COURSE**: No

E. **COURSE LENGTH**: 15 weeks including exam week

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

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY**: Four lecture hours per week.

H. **CATALOG DESCRIPTION**: This course is the first of a two-semester sequence of intermediate algebra and trigonometry with technical applications. Topics include: review of the fundamental concepts of algebra, units of measurement and approximate numbers, functions and graphs, trigonometry functions, systems of linear equations, factoring, rational expressions, quadratics, and geometry (areas and perimeters of common plane figures, volumes and surfaces of common solids).

I. **PRE-REQUISITES/CO-COURSES**: Applied College Mathematics (MATH 101) with a grade of C or better, or New York State Math A or Integrated Math Regents or equivalent examination with a grade of 75 or above, or permission of instructor.

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

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<th>Course Objective</th>
<th>Institutional SLO</th>
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<tbody>
<tr>
<td>a. Apply fundamental concepts and operations of algebra in solving problems</td>
<td>1. Communication</td>
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<td>2. Critical Thinking</td>
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<td>b. Solve application problems involving geometric shapes, solids, and dimensional analysis</td>
<td>1. Communication</td>
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<td>2. Critical Thinking</td>
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<td>c. Evaluate and graph linear and non-linear functions</td>
<td>1. Communication</td>
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<td>2. Critical Thinking</td>
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<td>d. Solve problems involving right and oblique triangles</td>
<td>1. Communication</td>
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<td>2. Critical Thinking</td>
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<td>e. Solve systems of equations involving whole numbers, fractions and decimals, graphically and algebraically</td>
<td>1. Communication</td>
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<td>2. Critical Thinking</td>
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<td>f. Solve rational and quadratic equations</td>
<td>1. Communication</td>
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<td>2. Critical Thinking</td>
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<td>g. Solve problems involving ratios, proportions, and variation</td>
<td>1. Communication</td>
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<td>2. Critical Thinking</td>
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<td>h. Solve word problems of the trades and use estimation to determine the reasonableness of the answer</td>
<td>1. Communication</td>
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<td>2. Critical Thinking</td>
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L. **REFERENCES**: None
M. **EQUIPMENT:** 2-line display scientific calculator

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

O. **MEASUREMENT CRITERIA/METHODS:** Methods include:
   - Exams
   - Homework/quizzes
   - Projects

P. **DETAILED COURSE OUTLINE:**

I. Fundamental Concepts and Operations of Algebra
   A. Arithmetic, Real Numbers
      1. Basic concepts
      2. Properties
      3. Operations
   A. Exponents
      1. Rules of exponents
      2. Scientific notation
      3. Roots and radicals
   B. Operations with polynomials
   C. Equations
      1. Linear
      2. Literal equations and formula manipulation
      3. Applications

II. Geometry
   A. Basic geometric figures and definitions
   B. Basic geometric formulae (area, perimeter, volume, surface area)
   C. Basic Metric Units and Dimensions of Analysis

III. Functions and Graphs
   A. Functions
      1. Linear; slope, distance formula, equations of straight lines
      2. Evaluating non-linear functions
      3. Applications
   B. Graphs
      1. Rectangular coordinate system
      2. Graph of a function

IV. Trigonometric Functions
   A. Defining basic trig functions of sine, cosine, and tangent
   B. Values of trig functions
   C. Right triangles
   D. Applications of right triangles
   E. Applications of oblique triangles

V. Systems of Linear Equations: Determinants
   A. Solving systems of linear equations in two variables (graphically, and algebraically)
   B. Applications

VI. Factoring, Fractions, and Quadratic Equations
   A. Factoring
   B. Rational Expressions
   C. Methods of solving quadratic equations
   D. Graph of the quadratic equations
VII. Ratio, Proportion, and Variation
   A. Ratio and Proportion
   B. Direct Variation
   C. Indirect Variation
   D. Joint and Combined Variation

Q. LABORATORY OUTLINE: NA