MATH 136 - TECHNICAL MATH II

A. **TITLE:** Technical Math II

B. **COURSE NUMBER:** MATH 136

C. **CREDIT HOURS:** 4

D. **WRITING INTENSIVE COURSE:** No

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

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

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

H. **CATALOG DESCRIPTION:** This course is the second of a two-semester sequence of intermediate algebra and trigonometry with technical applications. Topics include: Review of the graphs of the sine and cosine function, review of complex numbers and their applications, exponents and radicals, exponential and logarithmic functions, ratio, proportion and variation, oblique triangles, inequalities, introduction to statistics and an intuitive approach to calculus.

I. **PRE-REQUISITES/CO-COURSES:** Technical Math I (MATH 135) with a grade of C or better, or permission of instructor.

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

<table>
<thead>
<tr>
<th>Course Objective</th>
<th>Institutional SLO</th>
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<tbody>
<tr>
<td>a. Interpret and draw inferences from mathematical models such as formulas, graphs, tables, and schematics;</td>
<td>Critical Thinking Communication</td>
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<tr>
<td>b. Represent mathematical information symbolically, visually, numerically, and verbally;</td>
<td>Critical Thinking Communication</td>
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<tr>
<td>c. Employ quantitative methods such as, arithmetic, algebra, geometry, or statistics to solve problems;</td>
<td>Critical Thinking</td>
</tr>
<tr>
<td>d. Estimate and check mathematical results for reasonable ness; and</td>
<td>Critical Thinking Inter-Intrapersonal Skills</td>
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<tr>
<td>e. Recognize the limits of mathematical and statistical methods</td>
<td>Critical Thinking Communication</td>
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L. **REFERENCES:** none

M. **EQUIPMENT:** Graphing Calculator (TI-84 Plus Silver), Laptop Computer (Verizon only)

N. **GRADING METHOD:** A-F
MATH 136 - TECHNICAL MATH II

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

P. **DETAILED COURSE OUTLINE:** See attached.

Q. **LABORATORY OUTLINE:** N/A
MATH 136 - TECHNICAL MATH II

DETAILED OUTLINE

I. Trigonometric Functions
   A. Trigonometric Functions of Any Angle
   B. Radian Measure
   C. Application of Radians

II. Vectors and Oblique Triangles
   A. Graphing Addition of Vectors
   B. Component Addition of Vectors
   C. Applications of Vectors
   D. Law of Sines
   E. Law of Cosines
   F. Application of Oblique Triangles

III. Graph of Trigonometric Functions
   A. Graphs of Sine and Cosine Functions
   B. Amplitude, Period, and Phase Shift
   C. Graph \( y = a \cdot \sin (bx + c) \) and \( y = a \cdot \cos (bx + c) \)
   D. Composite Curves

IV. Exponents and Radicals
   A. Integral Exponents
   B. Fractional Exponents
   C. Simplification of Radicals
   D. Basic Operations with Radicals
   E. Equations with Radical

V. Complex Numbers
   A. Operations of Complex Numbers in Rectangular Form
   B. Polar and Exponential Form of Complex Numbers
   C. Multiplication and Division in Polar and Exponential Form
   D. Powers and Roots Using DeMoirve’s Theorem

VI. Exponential and Logarithmic Functions
   A. Exponential Functions
   B. The Logarithm
   C. Properties of Logarithms
   D. Common Logarithms
   E. Natural Logarithms
   F. Solving Exponential Equations
   G. Solving Logarithmic Equations
   H. Graphing on Log and Semi-log Paper

VII. Statistics
   A. Graphical Presentation of Data
   B. Measures of Central Tendency
   C. Measure of Dispersion
   D. Normal Distribution
   E. Standard Error
   F. Fitting Curves to Data
   G. Statistical Process Control

VIII. Intuitive Approach to Calculus (Optional)
   A. Limits
B. Average Value of Function
C. Average Rate of Change
D. Area Under a Curve
E. Root Mean Square of a Function