SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: MATH 132 Department: Mathematics

Course Title: Technical Mathematics 1 Semester: Spring Year: 1997

Objectives/Competencies

Course Objective	Competencies
1. Apply Exponent Laws.	1. Apply multiplication and division property. 2. Apply power-to-power and zero exponent property. 3. Apply the negative exponent property. 4. Evaluate numerical expressions involving exponents and radicals.
2. Understand the Concepts of Scientific Notation and Engineering Notation.	1. Convert a umber from decimal form to scientific notation form. 2. Convert a number in scientific notation form to decimal form. 3. Be able to evaluate expression using scientific notation and engineering notation. 4. Enter a number of scientific notation and engineering notation on a calculator. 5. Set calculator in scientific notation and engineering notation mode.

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3. Understand the Concept of Significant Digits.	1. Define precision. 2. Define accuracy. 3. Add or subtract and round result to the correct precision. 4. Multiply or divide and round result to appropriate number of significant digits.
4. Understand Dimensional Analysis.	1. Convert units within a system. 2. Convert units between systems. 3. Determine units of a result given units of intermediate factors. 4. Apply unit prefixes such as nano, kilo, etc.
5. Evaluate Formulas.	1. Substitute values and evaluate a formula. 2. Round result of an evaluation to the correct number of significant digits. 3. Determine the correct units of a formula
6. Solve Equations.	1. Solve, linear equations. 2. Solve quadratic equations by factoring and by using the quadratic formula. 3. Solve formulas for the indicated (linear or quadratic) variable. 4. Solve equations and formulas involving radicals. 5. Solve equations involving a single trigonometric function.
7. Solve Systems of Linear Equations in Two and Three Variables.	1. Solve a two by two system by graphing or by substitution

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	or by using elimination. 2. Evaluate a two by two determinant. 3. Solve a two by two system using Cramer's Rule. 4. Evaluate a three by three determinant. 5. Solve a three by three system using Cramer's Rule.
8. Understand the concept of Function.	1. Identify a function from a set or ordered pairs and from a graph. 2. Evaluate a function. 3. Determine the domain and range of a funciton. 4. Evaluate a compound function. 5. Define a function based on an applied problem. 6. Sketch the graph of a function.
9. Analyze Linear Functions.	1. Define linear functions. 2. Plot a linear function using a table of values and by computing its intercepts. 3. Find the slope of a linear given two points. 4. Identify slope and y-intercept of a linear function. 5. Plot a linear function using the slope and y-intercept. 6. Find an equation of the line passing though a point and parallel to a given line or a given point and perpendicular to a given line. 7. Derive a linear relationship based on an applied problem.
10. Analyze Quadratic Functions.	1. Define quadratic function. 2. Find the vertex and the x and y-intercepts of a quadratic

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	function. 3. Determine the maximum or minimum value of a gradratic function. 4. Plot a quadratic function. 5. Solve applied maxima or minima problems dealing with quadratic functions.
11. Evaluate Trigonometric Functions.	1. Define the six trigonometric functions in terms of a right triangle and the coordinate system. 2. Convert degrees to radians and radians to degrees. 3. Evaluate the trigonometric function of an angle using a table and a calculator. 4. Evaluate inverse trigonometric functions using a table and a calculator.
12. Solve Right Triangles.	1. Solve a right triangle given two sides and given an acute angle and one side. 2. Solve applied right triangle problems.
13. Analyze Vectors.	1. Perform basic vector operations graphically. 2. Convert from polar form to rectangular form and from rectangular form to polar form using a calculator. 3. Solve a vector system graphically and using components.
14. Analyze Graphs of the Sine and Cosine Functions	1. Find the amplitude, period, and phase shift of a sine or cosine function. 2. Plot one period of a since or cosine function and plot

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15. Understand Complex Numbers.	functions which are combinations of sine and cosine functions. 3. Solve applied problems dealing with graphs of sine and cosine functions. 1. Simplify radicals having negative radicands. 2. Write complex numbers in rectangular, polar, and trigonometric forms. 3. Evaluate powers of j. 4. Find sums, differences, products, quotients, power, and roots of complex numbers. 5. Solve quadratic equations having complex roots. 6. Add, subtract, multiply, and divide vectors using complex numbers. 7. Solve alternating current problems using complex numbers.