COURSE INFORMATION FORM

DISCIPLINE  MATH
COURSE TITLE  Technical Mathematics I with Review
CR.HR  4  LECT HR  4  LAB HR  0  CLIN/INTERN HR.  0  CLOCK HR.  

CATALOG DESCRIPTION
A review of basic math operations including decimals, fractions, percents, and order of operations. Algebraic expressions, linear equations and systems of linear equations, functions, exponents, graphical analysis, quadratic equations, factoring common factors and difference of squares, unit conversions, percents, and tolerances, clearance, interference, mean, median and mode presented through problem solving activities. The focus of the course is on application of the math in real life situations and industrial disciplines through the use of critical thinking skills.

PREREQUISITES
MATH 20 or MATH 20L or appropriate score on placement test.

EXPECTED STUDENT OUTCOMES IN THE COURSE
Upon completion of this course, the student will be able to:
1. Demonstrate skill in using algebra, critical thinking, and scientific calculator or computer to solve simple and multi-step problems in the technical fields.
2. Analyze reasonableness of solutions to algebraic problems.
3. Demonstrate understanding of and correct use of the vocabulary, symbols, and notation of algebra.
4. Demonstrate skill in simplifying and manipulating algebraic equations (including simple fractional equations).
5. Solve equations (including fractional equations) algebraically and with a grapher.
6. Sketch and analyze a graph by hand and with a grapher.
7. Solve systems of linear equations algebraically and with a grapher.
CLASS-LEVEL ASSESSMENT MEASURES

Student accomplishment of expected student outcomes will be assessed using the following measures. (Identify which measures are used to assess which outcomes.)

1. Homework (outcomes 1-7)
2. Computer assignments and/or graphing calculator assignments (outcomes 1,2, 5-7)
3. Projects, reports, journals (outcomes 1-7)
4. Exams and quizzes (outcomes 1-7)

PROGRAM-LEVEL OUTCOMES ADDRESSED

General Education Outcomes
Specify which general education outcomes, if any, are substantially addressed by the course by completing the “Course/Program Assessment Matrix” to show the relationship between course and program outcomes and assessment measures.

Occupational Program Outcomes
Specify which occupational program outcomes, if any, are substantially addressed by the course by completing the “Course/Program Assessment Matrix” to show the relationship between course and program outcomes to assessment measures.
Individual instructors may order this outline as fits the needs of their individual courses. In addition, they may place more emphasis on some areas than on others. What is assured is that this particular list is covered in the course. Other topics may be added to a course as the instructor sees fit, and as time and interest allow. An *asterisk can be used to mark an item as optional.

I. Whole numbers
   A. Arithmetic operations
   B. Rounding and estimating
   C. Exponents
   D. Order of operations
II. Fractions
   A. Simplify fractions
   B. Converting between fractions and mixed numbers
   C. Arithmetic operations on fractions and mixed numbers
   D. Real-life applications of fractions and mixed numbers
III. Decimals
   A. Converting between fractions and decimals
   B. Arithmetic operations of decimals
   C. Real-life applications of decimals
IV. Ratios and proportions
   A. Ratios and applications
   B. Rates and applications
   C. Proportions and applications
V. Percents
   A. Converting between fractions, decimals and percents
   B. Simple percent applications
VI. Rational numbers
   A. Arithmetic operations on integers
   B. Absolute value notation
   C. Scientific notation
VII. Algebraic expressions and integer exponents
   A. Addition and subtraction of algebraic expressions
   B. Multiplication and division of algebraic expressions
   C. Integer exponents
VIII. Unit conversions (between systems) and statistics
   A. Metric – metric
   B. English – English
   C. Metric – English
   D. Tolerances, clearance, interference
   E. Mean, mode, and median
IX. First-degree equations and applications
   A. Solving first-degree equations
   B. Solving application problems
      1. Percent problems
      2. Rate problems
      3. Mixture problems
      4. Statics problems
      5. Ratios and proportions
      6. Speed of revolution problems
X. Functions and graphing
   A. Function notation
   B. Composite functions
   C. Inverse functions
   D. Rectangular coordinates, graphing a line, graphing empirical data
   E. Graph of a function
   F. Graphing calculator or computer
   G. Graphing formulas and parametric equations

XI. Factoring, fractions and fractional equations
   A. Finding common factors
   B. Difference of two squares formula
   C. Simplification of fractions
   D. Multiplication and division of fractions
   E. Addition and subtraction of fractions
   F. Complex fractions
   G. Fractional equations
   H. Word problems leading to fractional equations
   I. Literal equations and formulas

XII. Systems of linear equations
   A. Solving systems of linear equations algebraically
   B. Solving systems of linear equations with a grapher
   C. Solving systems of linear equations by determinants or matrices (using technology)*

XIII. Rational exponents and radicals
   A. Estimation of radicals
   B. Simplification of radicals
   C. Operations with radicals
   D. Rational exponents
   E. Radical equations

XIV. Quadratic equations
   A. Solving quadratic equations by using the quadratic formula
   B. Solving quadratic equations by using a grapher or computer
   C. Applications and word problems involving quadratic equations