

COURSE OUTLINE **Technical Mathematics I**

Course Description

MA 114. Technical Mathematics I. 3 hours credit. Prerequisite: Placement score or MA 060 with a C or better. This course will enable the student to directly apply mathematics to several fields of study. The student will learn the practical applications of conversion factors, geometry, and right angle trigonometry.

Course Relevance

The skills learned in this course are required for occupations such as computer aided design, machine technology, and other areas of technology.

Required materials

MA 114 Textbook:

Ewen, D. (2003). *Elementary Technical Mathematics*. (8th ed.). Belmont, CA:
Brooks/Cole-Thompson Learning.

Learning Outcomes

The intention is for the student to be able to

1. Use problem solving to be successful in their chosen field
2. Recognize the connection between what they are learning and how to apply it in their occupation
3. Perform math procedures and techniques correctly
4. Gain confidence in personal math ability
5. Create and interpret graphs
6. Demonstrate field specific proficiency

Primary Learning PACT Skills that will be DEVELOPED and/or documented in this course

Through the student's involvement in this course, he/she will develop his/her ability in the following PACT skill areas:

1. Problem solving
 - Through the solution of multi-step problems
 - Through the solution of field specific problems

Secondary (developed but not documented):

Teamwork
Reading
Listening

Major Summative Assessment Task(s)

These learning outcomes and the primary Learning PACT skills will be demonstrated by:

1. The student's solution of multi-step problems that synthesize the material covered in class.

Course Content

- I. Themes – Key recurring concepts that run throughout this course:
 - A. Recognize an appropriate approach
 - B. Direct application of course material to job skills
- II. Issues – Key areas of conflict that must be understood in order to achieve the intended outcome:
 - A. Remembering prerequisite material
 - B. Balance between specific skills and abstract concepts
- III. Concepts – Key concepts that must be understood to address the issues:
 - A. Graphing
 - B. Functions
 - C. Geometry
 - D. Number sense
- IV. Skills/Competencies – Actions that are essential to achieve the course outcomes:
 - A. Number sense
 - B. Fractions
 - C. Proportional reasoning
 - D. Geometry
 - E. Powers and roots
 - F. Functions
 - G. Modeling

Learning Units

- I. Number sense
 - A. Review of basic operations
 - B. Percent
 - C. Scientific notation
- II. The Metric system
 - A. Length, mass time, and volume units
 - B. Metric and English conversion
- III. Problem solving with geometry
 - A. Use formulae to find perimeter, area, and volumes of various geometric shapes
 - B. Use right triangle formulae with angles and roots
- IV. Measurement
 - A. Approximations and accuracy
 - B. Relative error and percent error
 - C. Addition and subtraction of measurements
 - D. Multiplication and division of measurements

- V. Equations
 - A. Formulas
 - B. Substituting data into formulas
- VI. Ratio and proportion
 - A. Ratio
 - B. Proportion
- VII. Graphing linear equations
 - A. Linear equations
 - B. Graphing linear equations
 - C. The slope of a line
- VIII. Geometry
 - A. Angles and polygons
 - B. Factoring trinomials
 - C. Circles
 - D. Prisms
 - E. Pyramids and cones
 - F. Spheres
- IX. Right triangle trigonometry
 - A. Trigonometric ratios
 - B. Using trig ratios to find angles
 - C. Using trig ratios to find sides
 - D. Solving right triangles
 - E. Applications involving trigonometric ratios

Learning Activities

Classroom: Independent learning activities will be assigned to assist the student to achieve the intended learning outcomes. Activities identified in the syllabus, such as class discussion, lecture, reading, group work or projects will also contribute to learning.

Online: Online teaching/learning activities such as the following will assist the student to achieve course outcomes: posted web pages, threaded discussions, written assignments, assigned reading, and interaction with instructor through email and discussion boards.

Grade Determination

Grade determination will be based on assessment tasks and other activities such as exams, assignments or attendance that the instructor identifies in the syllabus.