

COURSE OUTLINE
MT. HOOD COMMUNITY COLLEGE DISTRICT
Gresham, Oregon 97030

* New _____
 * Revised _____
 * Review only (no changes) 10/1/07
 (Date)

* COURSE TYPE Please check appropriate box:

- Lower Division Collegiate
 Occupational Supplementary
 Occupational Preparatory
 Other Education, Including General Ed & Adult Ed

COURSE TITLE Technical Mathematics I

COURSE NUMBER MTH80 COURSE CREDIT 4

* Lecture Hours 3 | 30 Lab Hours 2 | _____ Seminar Hours _____ | _____
 Wkly/Term Wkly/Term Wkly/Term

* GRADING STATUS:

- Letter Grade Only
 S/U Only
 Optional
 No Grade

* HEADCOUNT LOADING:

- Yes
 No * Factor _____

Guided Studies Requirement:

Student must be proficient in:

- Reading (RD90)
 Writing (WR90)
 Mathematics (MTH20)
 Not applicable

For Instruction Office Use Only General Education Category Apply general requirement or distribution to:		
AA _____	AS _____	AS/OT-Bus _____
AAS _____	AGS _____	
VP Approval _____	Date _____	

1) Prepared by _____ Date _____

4) Approved by Dean _____ Date _____

2) Approved by Distance Education Admin. _____ Date _____

5) Curriculum Committee _____ Date _____

3) Approved by Department Chair _____ Date _____

6) Approved by VP for Student Learning _____ Date _____

* See legend/definition for explanation

COURSE DESCRIPTION: (for catalog)

This is a technical mathematics course for students in selected professional technical programs. Topics covered include graphs and equations of lines, applications of linear models and solving literal equations, extensive geometry including angle relationships, surface area and volume of three-dimensional figures, right triangle trigonometry, and basic statistics. Emphasis is placed on modeling problem situations numerically, visually, graphically and/or algebraically. In-depth problems from various fields are a core part of the curriculum. A graphing calculator is required and integrated throughout.

PREREQUISITE:

Math 60 with a C or better, or suitable performance on the mathematics placement exam.

INSTRUCTIONAL MATERIALS REQUIRED OF STUDENT: (text, supplies, etc.)

Text, TI-83 or TI-83+ Graphing Calculator, Engineering Paper, Protractor, 15-cm. ruler.

STUDENT LEARNING OUTCOMES:

Upon successful completion of this course, the student will be able to:

1. Overarching Objectives

Goal: Create capable problem solvers and creative learners able to deal with real-world mathematics and communicate at this level.

- a) Communicate effectively (orally and in writing) a problem solving process, results, and conclusions using mathematical terminology and correct mathematical syntax appropriate to the level of study.
- b) Apply mathematical reasoning and modeling to solve problems arising from the real world.
- c) Model problem situations using mathematics verbally, numerically, visually, graphically, and/or algebraically, and make connections among the four models as appropriate at this level.
- d) Determine if a solution is reasonable and verify results.
- e) Use skills from previous courses in problem solving and application situations (especially area, Cartesian coordinates, ratios, Proportions, formulas, and unit conversions).

2. Equations

Goal: Develop fluency in algebraic processes at this level

- a) Distinguish between expressions and equations, between simplifying and solving.

Factoring

- a) Factor out common factors in a multi-term algebraic expression.

Solving Literal Equations

- a) Solve literal equations and formulas for a first-degree variable. The solving process should include monic factoring.

Verify literal solutions using numerical substitution.

3. Linear Relationships

Goal: Engage students in problem solving that incorporates their past geometrical knowledge as well as three-dimensional geometry and coordinate geometry.

Three-Dimensional Figures

- a) Calculate lateral area, surface area and volume of prisms, cubes, cylinders, cones, pyramids, spheres and combined solids in applications.

Coordinate Geometry

- a) Define and apply latitude and longitude to identify a point on a map.
- b) Locate a point in the plane using polar coordinates.
- c) Convert between polar and rectangular coordinate representations.

4. Trigonometry

Goal: Develop fluency in solving problems involving angles and right triangle trigonometry.

Angles

- a) Measure angles using a protractor and estimate the measurement of angles.
- b) Identify and define straight, right, acute, obtuse, and co terminal angles.
- c) Convert between decimal degrees and degrees, minutes, seconds.
- d) Construct geometric figures with specific length and angle measurements using a protractor and a ruler.
- e) Create scale drawings and report and scale of the drawing.
- f) Use the properties of similar triangles to solve application problems.
- g) Determine unknown angles in geometric figures using the principles of complementary, supplementary, adjacent, opposite, alternate interior, and corresponding angles; and parallel and perpendicular lines.
- h) Solve triangles using properties of equilateral, right and isosceles triangles.
- i) Determine missing angles in polygons given sufficient information.
- j) Distinguish between an angle in “standard position” and a bearing angle.

Right Triangle Trigonometry

- a) Define radians and use radians to solve applications involving arc length, sector area, and angular velocity.
- b) Convert between radians and degrees.
- c) Define all six trigonometric relationships based on a right triangle.
- d) Evaluate sine, cosine and tangent ratios for interior angles of a right triangle given sufficient information.
- e) Solve for any part of a right triangle given sufficient information.
- f) Model real-world problems using the right triangle trigonometric definitions. Include problems involving percent slope.

5. Statistics

Goal: Foster familiarity with the mean and measurements of variation in context.

- a) Define and compute the mean of a set of data. Explain the meaning of the mean in the context of a data set.
- b) Define and compute the standard deviation, the coefficient of variation, and the standard error of a data set. Explain the meaning of each measurement of variation in the context of a data set.
- c) Explain how two sets of data (one with large standard deviation and one with small standard deviation) can have the same mean.
- d) Use the mean, standard deviation, coefficient of variation, and standard error to describe data from a real-world situation.
- e) Given the mean, standard deviation, coefficient of variation, and standard error from a real-world situation, explain what these statistics mean.

GENERAL INSTRUCTIONAL METHODS:

Passing this course with a C or better serves as a prerequisite for Math 95. Ensure that your grading plan will mean that students satisfying this requirement are prepared for Math 95. This requires attention to the amount of verifiable individual work completed by the student. You must give a cumulative in-class final exam to help ensure that students are truly prepared for the next course.

EVALUATION PROCESS:

Grades should be based on a balanced variety of grading opportunities spread throughout the term. Although you may not choose to use every method below, a variety of methods is expected. Student evaluation must include problems or activities that incorporate and integrate several outcomes, and closely resemble situations that exist in the real world.

- Worksheets
- Projects
- In-class Individual Exams
- In-class Team Exams
- Take-Home Individual Exams
- Take-Home Team Exams
- Writing Assignments
- Daily Homework
- Attendance
- Teamwork/Participation