College of Micronesia - FSM
Course Modification Request

MS 104 Technical Math I — Course Number and Title
Technology and Trade — Department

Same as above — Recommended Course Number and Title
Same as above — Department

New Course Objectives:
No change

New Course Description:
No change

Revision/s Requested:

Request 1 is add the word "(MS 100 level) or" after the word Admission in the Prerequisite for MS 104 in page 1.

Justification for Revision 1:

The revision is to place students with MS 100 level entrance test scores to be placed in MS 104 if they enroll in the vocational program.

Request 1 is to add "a grade of C or better in MS098" in the list of prerequisites on page I of the MS 104 course outline.

Justification for Revising the Course:
The revision is to define the prerequisites for students who do not place in MS 104 and have to take remedial course/s before they can take MS 104.

2/17/05

2/25/05
Date

Official Use Only

New Course Number and Title:

MS 104 Technical Math I College of Micronesia-FSM

College of Micronesia - FSM
P.O. Box 159
Kolonia, Pohnpei

Course Outline Cover Page

Technical Mathematics I — Course Title
MS 104 — Department and Number

Course Description: The first of two courses designed to provide vocational students with the mathematical tools needed to succeed in selected occupational programs. Topics covered are basic mathematics, measurements, and the fundamental concepts of algebra, geometry and trigonometry.

Prepared by: Brent Villiers **State:** National Campus

	Hours per Week	No. Of Weeks	Total Hours	Semester Credits
Lecture	3/6	16/8	48	3
Laboratory	3/6	16/8	48	1
			Total Semester Credits:	4

Purpose of Course:

Degree Requirement	_____
Degree Elective	_____
Advanced Certificate	_____
Certificate	_____XX_____
Remedial	_____
Other (Workshop)	_____

Prerequisite Course(s): Admission (MS 100 level) or "C" or better in MS098

2/17/05
Date Approved by Committee

2/28/05
Date Approved by the President

General Objective:
This course is designed to give all students entering the workforce technical and occupational programs the fundamental mathematical skills to succeed in their chosen field of study. The student will demonstrate mathematical problem solving and reasoning skills.

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

1. Score 80% (C grade) or better in either the Basic Math pre or post-test.
2. Compare the two different standards of measurement and convert between the two. Convert numbers to scientific notation and identify and correctly use measurement tools.
3. Determine angular and circular measurements.

4. Determine by measurement the area of rectangles, squares, parallelograms, triangles, trapezoids and circles.
5. Measure the volume of rectangular solids, cubes, prisms, pyramids, cylinders, cones and spheres. Differentiate between liter and cubic centimeter measurements.
6. Perform fundamental algebraic calculations and solve linear equations.
7. Perform basic trigonometric calculations.

STUDENTS SHOULD BE MADE AWARE OF OCCUPATIONAL HEAL TH AND SAFETYISSUES INALL SITUATIONS AND BE EXPECTED TO DEMONSTRATE SAFE WORKING PRACTICES AT ALL TIMES.

Outline of Content: This course contains:

1. Basic Math
   - Addition and Subtraction of whole numbers
   - Change between improper fraction, whole numbers and mixed numbers.
   - Add, subtract, multiply and divide fractions.
   - Add, subtract, multiply and divide decimal fractions.
   - Add, subtract, multiply and divide signed numbers.
   - Calculate percents.
   - Calculate exponents and square roots.
   - Use power of tens and metric notation.
2. Measurement
   - Identification and use of rulers, micrometers and venires calipers.
   - Metric and British measurement systems.
   - Angular and Circular measurements.

- Area measurements.
- Volume measurements.

3. Algebra
   - Describe real numbers, properties of real numbers and basic algebraic concepts.
   - Solve linear equations in the form AX = B & X/A = B.
   - Solve linear equations in the form AX + B = C and X/A + B+C.

4. Trigonometry
   - Identify angles.
   - Convert between degrees and radians.
   - Pythagorean Theorem
   - Find the sine, cosine, tangent, cosecant, secant and cotangent of a given angle.
   - Relationship between the unit circle and trigonometric functions.

The Basic Math Pre-Test and Post-Test covers the following areas.

- Addition and Subtraction of whole numbers
- Change between improper fraction, whole numbers and mixed numbers.
- Add, subtract, multiply and divide fractions.
- Add, subtract, multiply and divide decimal fractions.
- Add, subtract, multiply and divide signed numbers.
- Calculate percents.
- Calculate exponents and square roots.
- Use power of tens and metric notation.

Failure to achieve at least an 80% overall result will require the student to complete the assessment criteria for which the student has been deemed to be below the required competency. The student prior to attempting any other learning outcome in this course outline must successfully complete the Basic Math Pre or Post-Test.

Learning Outcomes: On completion of this course the learner will be able to:

Learning Outcome 1 **Score 80% (C grade) or better in either the Basic Math pre or post-test.**

Assessment Criteria **Addition and Subtraction**

a. Describe the decimal number system.
b. Describe the whole number line.
c. Describe addition.
d. Add whole numbers.
e. Describe subtraction.
f. Subtract whole numbers.

Multiplication and Division

a. Describe Multiplication.
b. Multiply whole numbers.
c. Describe division.
d. Divide whole numbers.

Fractions

a. Describe fractions.
b. Describe proper and improper fractions.
c. Change improper fractions to whole numbers or mixed numbers.
d. Change mixed numbers to improper fractions.
e. Reduce fractions to the lowest terms.

Fraction Operation

a. Add fractions.
b. Subtract fractions.
c. Multiply fractions.
d. Divide fractions.

Decimal Fractions

a. Describe decimal fractions.
b. Recognize positional values in decimal fractions.
c. Convert decimal fractions to standard fractions.
d. Convert standard fractions to decimal fractions.
e. Add decimal fractions.
f Subtract decimal fractions.
g. Multiply decimal fractions.
h. Divide decimal fractions.

Signed Numbers

a. Describe signed numbers.
b. Describe the signed number line.
c. Determine the relationship between two signed numbers.
d. Add signed numbers.
e. Subtract signed numbers.
f. Multiply signed numbers.
g. Divide signed numbers.

Percents

a. Describe percents.
b. Change percents to decimal numbers.
c. Change decimal numbers to percents.
d. Calculate the percentage part.
e. Calculate the percentage rate.
f. Calculate the percentage base.

Exponents and Square Roots

a. Describe exponents.
b. Calculate the result of numbers that use exponents.
c. Describe square roots.
d. Calculate square roots.

Assessment Method Multiple choice questions
Short answer questions

Learning Outcome 2 **Compare the two different standards of measurement and convert between the two. Convert numbers to scientific notation and identify and correctly use measurements tools.**

Assessment Criteria a. Define precision and determine which measurement applications require more or less precision.
b. Identify the following measurement tools: standard ruler, micrometer and vernier caliper.
c. Define linear measurement tools are used:
standard ruler, micrometer and vernier caliper.
d. Describe how the following measurement tools are used:
e. Convert between Metric and British measurement systems.
f. Convert between British and Metric measurement systems.
g. Convert numbers to scientific notation.

Assessment Method Multiple Choice questions
Short answer questions

Learning Outcome 3 **Determine angular and circular measurements.**

Assessment Criteria a. Describe the basic angular and circular characteristics including angles, diameter and radius.
b. Describe angular measurements using a Try Square, Carpenter's Square, Protractor, Sliding T-Bevel and a Combination Square.
c. Describe circular measurements using Calipers, Micrometers and Vernier Calipers.

Assessment Method Multiple choice questions
Short answer questions

Learning Outcome 4 **Determine by measurement the area of rectangles, squares, parallelograms, triangles, trapezoids and circles.**

a. Define rectangles and squares.
b. Define the differences between rectangles and squares.
c. Use the area formula for squares and rectangles.
e. Determine the relationship between parallelograms and triangles.
f. Use the area formula for parallelograms and triangles.
g. Define trapezoid.
h. Differentiate trapezoids from parallelograms.
i. Define the dimensions of a circle:
    - Radius
    - Diameter
    - Circumference

j. Execute the formulas for finding the area and circumference of a circle.

Assessment Method Multiple choice questions

Short answer questions

Learning Outcome 5 **Measure the volume of rectangular solids, cubes, prisms, pyramids, cylinders, cones and spheres. Differentiate between liter and cubic centimeter measurements.**

Assessment Criteria
a. Define volume and describe how it relates to area.
b. Differentiate between the liter, the cm3 an the meter3.
c. Solve problems of volume measurement in a solid rectangle.
d. Define and recognize a prism.
e. Define and recognize a pyramid.
f. Using formulas for each, solve problems of prism and pyramid volume.
g. Define and recognize a cylinder.
h. Define and recognize a cone.
i. Define and recognize a sphere.
j. Using formulas for each, solve problems of cylinder, cone and sphere volume.

Assessment Method
Multiple choice questions
Short answer questions

Learning Outcome 6 **Perform fundamental algebraic calculation and solve linear equations.**

Assessment Criteria
a. Describe Real Numbers.
Describe the four fundamental operations of Real Numbers.
Describe Real Number Variables.
Describe the order of operations.
Combine Real Number Variables.
Describe the Real Number properties of closure, commutative, associative, identity, inverse and distributive.
Describe the Addition and Subtraction Laws of linear equations.
Solve x+A=B type of equations.
Solve x-A= B type of equations.
Describe the Multiplication and Division Laws of linear equations.
Solve X x A = B type of equations.
Solve X/A = B type of equations
For word problems:

- Describe problem formulas
- Place a word problem in an equation
- Solve for unknown quantities

Use the basic laws of equations to solve linear equations.
Solve problems in the form of ax + b = c and ax – b = c.
Use the four step process to solve word problems.
Solve word problems in the formula of linear equations.

Assessment Method
Multiple choice questions
Short answer question

Learning Outcome 7 **Perform basic trigonometric calculations.**

Assessment Criteria

a. Define the term angle.
b. Identify positive angles and negative angles.
c. Identify acute, obtuse, complimentary and supplementary angles.
d. Identify angle measurements using degrees, minutes and seconds.
e. Add and subtract angle measurements.
f. Determine the relationship between degree and radian.
h. Convert degrees to radians and vice versa.
i. Determine the unknown angle in a right triangle.
j. Use the Pythagorean Theorem to determine the unknown side of a right triangle.
k. Find the sine, cosine, tangent, cosecant, secant and cotangent of a given angle.
l. Identify the relationship between the unit circle and the trigonometric functions.

Assessment Method

Multiple choice questions
Short answer questions

Required Course Materials:

1. Instructor:

a. CAI Classroom with whiteboard or chalkboard
b. Text, Teacher's Resource Guide, workbook
c. Overhead projector, transparencies

2. Student:

a. Text(s), handouts provided by instructor
b. Ring binder
c. College ruled note sheet, pencil or pen
d. Scientific calculator

Reference Materials: **College Mathematics for Technology 6th'' edition by Cheryl Cleaves & Margie Hobbs**

Method of Instruction:

1. Computer Aided Instruction

Evaluation:

Final Grade for this course will be based on meeting the course requirements at the following percentage rates:

90%-100%	A - Superior
80%-89%	B - Above Average
70%-79%	C - Average
60%-69%	D - Below Average
59 % and below	F - Failure

Attendance:

The COM-FSM attendance policy will apply.