BUTTE COLLEGE
COURSE OUTLINE

I. **CATALOG DESCRIPTION**

MATH 20 - Trigonometry   **3 Unit(s)**

Prerequisite(s): MATH 124 or Math Level V

Recommended Prep: Two years of high school algebra and Reading Level IV

Transfer Status: CSU

51 hours Lecture

This course covers the theory and applications of trigonometry. The topics include definitions of circular and right triangle trigonometric functions, graphs, identities, equations, solutions of right and oblique triangles, vectors, polar coordinates, and complex numbers.

II. **OBJECTIVES**

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

A. Recall the three definitions for the six trigonometric functions and state their values for angles which are multiples of 30 and 45 degrees and their equivalent in radians.
B. Apply the definitions of the six trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines to solve any given triangle.
C. Prove a variety of trigonometric identities by applying knowledge of the basic identities, definitions, algebraic manipulation of rational expressions, and polynomial factoring.
D. Solve trigonometric applications, using triangles, circles, and vectors.
E. Graph the six trigonometric functions and their transformations.
F. Solve trigonometric equations by applying inverse trigonometric functions and algebraic reasoning.
G. Apply identity formulas involving the sum and difference of angles and double- and half-angles.
H. Convert between polar and rectangular forms of coordinates and equations and graph these in the polar plane, and use vectors to represent the trigonometric form of complex numbers in the complex plane.

III. **COURSE CONTENT**

A. **Unit Titles/Suggested Time Schedule**

Lecture

Topics	Hours
1. Defining Trigonometric Functions	5.00
2. Right Triangle Trigonometry	7.00
3. Radian Measure	6.00
4. Graphing and Inverse Functions	8.00
5. Identities and Formulas	8.00
6. Equations	6.00
7. Oblique Triangles and Vectors	8.00
8. Complex Numbers	3.00
Total Hours	51.00

IV. **METHODS OF INSTRUCTION**
    A. Lecture
    B. Collaborative Group Work
    C. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
    D. Discussion
    E. Board Work

V. **METHODS OF EVALUATION**
    A. Exams/Tests
    B. Quizzes
    C. Class Assignments and Class Response
    D. Daily Homework Assignments, where the student will demonstrate problem-solving skills

VI. **EXAMPLES OF ASSIGNMENTS**
    A. Reading Assignments
        1. Read the section in the textbook on Solving Right Triangles and be able to use Sine, Cosine, and Tangent to find the missing sides and angles of a right triangle when one acute angle and a side is given, or when two sides are given.
        2. Read the section in the textbook on Graphing Trigonometric Functions and be able to graph one cycle of the Sine, Cosine, Tangen, Cosecant, Secant, and Cotangent functions. Where applicable, be able to identify the period, amplitude, and phase shift of each function from the graph.
    B. Writing Assignments
        1. Graph examples of the Sine, Cosine, Tangent, Cosecant, Secant, and Cotangent functions. Where applicable, identify the period, amplitude, and phase shift of each function from the graph. Conversely, starting with a graph, describe the steps one must follow to find an equation that matches the graph. Assume you are explaining this to a group of students hearing this for the first time and write a detailed explanation.
        2. Explain the relationship between Definition 1 of Trigonometic Functions which utilizes the rectangular coordinate system and a circle, and Definition 2, which uses a right triangle only. Compare and contrast the advantages and disadvantages of the two definitions.
    C. Out-of-Class Assignments
        1. Review section on Right Triangle Trigonometry and do the problems assigned by the instructor, showing all work.
        2. Review the section on Finding a Trigonometric Equation from its Graph and do the problems assigned by the instructor, showing all steps.

VII. **RECOMMENDED MATERIALS OF INSTRUCTION**
    Textbooks:
    A. McKeague,C.P. _Trigonometry_. 6th Edition. Thomson - Brooks/Cole, 2008.

    Materials Other Than Textbooks:
    A. Scientific calculator or graphing calculator without symbolic algebra capabilities

Created/Revised by: Laurie Kincheloe
Date: 09/10/2012