BUTTE COLLEGE
COURSE OUTLINE

I. CATALOG DESCRIPTION

MATH 26 - College Algebra   **4 Unit(s)**

Prerequisite(s): MATH 124 or Math Level V
Recommended Prep: Two years high school algebra and Reading Level IV

Transfer Status: CSU/UC

68 hours Lecture

This course covers advanced algebra concepts beyond the scope of Intermediate Algebra. The topics include algebraic simplifying, conics, theory and solution of equations and inequalities, systems of equations, linear functions, exponential and logarithmic functions, polynomial and rational functions, binomial expansion and partial fractions. The course is specifically designed for preparation for first semester Calculus (MATH 30).

II. OBJECTIVES

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

A. Demonstrate proficiency solving polynomial, rational, radical, logarithmic, and exponential equations, and polynomial inequalities.
B. Demonstrate proficiency performing the four basic operations on real and complex numbers, polynomials, functions, rational expressions, and radical expressions.
C. Graph linear, quadratic, polynomial, and rational equations, and the conics, showing all asymptotes when appropriate and applying polynomial theory when necessary.
D. Expand binomials using the Binomial Expansion Formula and perform partial fraction decomposition.
E. Solve a variety of linear and non-linear systems of equations.
F. Solve applications using linear and quadratic equations, conic sections, and logarithms.
G. Demonstrate proficiency factoring polynomials into irreducible form.
H. Demonstrate proficiency evaluating, graphing, and finding the domain, range and inverse of a wide variety of functions including, but not limited to, exponential, logarithmic, and piece-wise functions.

III. COURSE CONTENT

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

Lecture

Topics	Hours
1. Expressions - Including binomial expansion and partial fractions	12.00
2. Graphing Equations - Including lines and conics	12.00
3. Functions	10.00
4. Solving Equations	10.00
5. Logarithms and Exponents	10.00
6. Systems of Equations	5.00
7. Polynomials - Including finding zeros and graphing	9.00
Total Hours	68.00

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 Transformations and be able to graph functions whose equations can be derived by transforming one of the six basic functions: $y = x$, $y = |x|$, $y = x^2$, $y = x^3$, $y = sqrt(x)$, and $y = 1/x$.
         2. Read the section in the textbook on Partial Fraction Decomposition and be able to break down a rational expression into a sum of simpler rational expressions that have either constant numerators, or numerators that are linear expressions of the form $Ax + B$.
     B. Writing Assignments
         1. Explain the procedure to follow for identifying holes and asymptotes of the graph of a rational function. Be sure to discuss how to tell if a zero of the denominator of a rational function - call it C - is the x-coordinate of a hole, or if the equation x = C is the equation of a vertical asymptote. Assume you are explaining this to a group of students hearing this for the first time and write a detailed explanation.
         2. Given a polynomial function of degree n, explain the procedure to follow for finding its zeros. Be sure to discuss the relationship between the zeros and the x-intercepts of the function, as well as how to tell if the graph of the function crosses the x-axis or simply touches it. Further, explain how the Leading Coefficient Test can be used to describe the behavior of the function as x approaches infinity from both the left and the right.
     C. Out-of-Class Assignments
         1. Review the section on Transformations and do the problems assigned by the instructor, showing your work.
         2. Review the section on Parabolas and do the problems assigned by the instructor, show all your work.

VII. **RECOMMENDED MATERIALS OF INSTRUCTION**
    Textbooks:
     A. Cabral, T. <u>College Algebra</u>. 1st Edition. Butte College, 2008.

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

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