SAN JOAQUIN DELTA COLLEGE DISTRICT
CREDIT COURSE OUTLINE

CATALOG INFORMATION

MATH 082 Intermediate Algebra 5.00 Units

This course is the second course in the algebra sequence. Elementary Algebra concepts including linear and quadratic equations, factoring polynomials, rational expressions and equations, exponents, radicals, equations of lines and systems of equations are reviewed and extended. New algebra topics such as functions, translation and reflection of functions, inverse functions, exponential and logarithmic functions and equations, absolute value equations and inequalities, polynomial and rational inequalities, conic sections, sequences, series and the Binomial Theorem are also included.

ENTRY SKILLS:

- Math Level II
- Reading Level II
- Math 80

ADVISORIES:

NONE

CATALOG PREREQUISITES:

MATH - 080 Elementary Algebra, with a minimum grade of C

COREQUISITES:

NONE

LIMITATIONS ON ENROLLMENT:

NONE

LECTURE HOURS PER WEEK:

Min Hours: 5 Max Hours: 5

LECTURE HOURS PER SEMESTER:

Min Hours: 80.00 Max Hours: 80.00

LAB HOURS PER WEEK:
Min Hours: 0 Max Hours: 0

LAB HOURS PER SEMESTER:
Min Hours: 0 Max Hours: 0

TOTAL HOURS PER SEMESTER:
Min Hours: 80.00 Max Hours: 80.00

COURSE REPEATABILITY: NO
REPEAT COUNT:

REPEAT UNITS:

RATIONALE:

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

1. Demonstrate knowledge and understanding of algebra at an intermediate skill level.

COURSE OBJECTIVES:
Specific Objectives: Upon successful completion of this course, the student will be able to:

1. Solve linear and absolute value equations and inequalities in one variable.
2. Graph linear equations and inequalities in two variables
3. Graph quadratic equations in two variables.
4. Solve systems of linear equations in two and three variables
5. Find real and complex solutions of quadratic equations by factoring
6. Solve rational equations using algebraic operations on rational expressions
7. Solve radical equations
8. Solve exponential and logarithmic equations using the properties of exponential and logarithmic functions
9. Graph conic sections
10. Demonstrate proficiency with sequences, series and the Binomial Theorem

OUTLINE OF TOPICS:
The following topics are included in the framework of the course but are not intended as limits on content. The order of presentation and relative emphasis will vary with instructors.

1. Review of Algebraic Expressions
2. Review of the Real Numbers and Their Properties
3. First Degree Equations and Inequalities
    a. Review of methods of solving linear equations

b. Applications involving linear equations
c. Absolute value equations
d. Absolute value inequalities
e. Intermediate formula evaluation and solving
f. Linear inequalities
g. Compound linear inequalities
h. Review of forms of linear equations
i. Graph systems of linear inequalities in two variables

4. Methods of Displaying Solutions
    a. Graphing
    b. Set builder and interval notation
    c. Intersection and union of sets
5. Review and Further Study of Exponents and Polynomials
    a. Exponents
    b. Scientific notation with application
    c. Algebraic operations on polynomials
    d. Factoring Polynomials
        i. Review of elementary methods of factoring
            1. Greatest common factor
            2. Factoring by grouping
            3. Factoring trinomials
            4. Difference of two squares
            5. Perfect square trinomials
        ii. New Topics
            1. Sums and differences of two cubes
            2. Factoring using substitution
            3. Synthetic division
6. Quadratic Equations
    a. Square root property
    b. Review of solution by
        i. Factoring
        ii. Completing the square
        iii. Quadratic formula
    c. Proof of the quadratic formula
    d. Applications involving quadratic equations
    e. Solution of non-linear inequalities (optional)
7. Rational Expressions and Functions
    a. Review and extend the study of Rational Expressions and Functions
        i. Operations on rational expressions
        ii. Simplifying complex rational expressions
        iii. Solving Rational equations
        iv. Solving rational inequalities
    b. New topics on Rational Expressions and Functions
        i. Domain and range of rational functions
        ii. Applied problems with rational equations.
        iii. Direct variation
        iv. Inverse variation
        v. Joint variation

8. Radicals
    a. Review and extend study of Radicals
        i. Radical expressions
        ii. Operations on radical expressions
        iii. Simplifying radical extressions
        iv. Rationalizing numerator or denominator
        v. Radical equations
        vi. Problem solving involving radical equations
    b. New Topics
        i. Complex Numbers
        ii. The discriminant and the nature of solutions
        iii. Nth roots
        iv. Rational exponents
9. Higher Order Equations
    a. Solving higher order equations
    b. Quadratic methods for solving higher order equations
10. Functions
    a. Definition of function
    b. Domain and range
    c. Function notation
    d. Linear functions
    e. Quadratic functions
    f. Algebra of functions
    g. Composition of functions
    h. One to one functions
    i. Inverse function
11. Review and Extend the Study of Systems of Linear Equations
    a. Matrices (optional)
    b. Determinants (optional)
    c. Solving 2x2 and 3x3 systems of linear equations by
        i. Graphing (2x2 only)
        ii. Elimination
        iii. Substitution
        iv. Matrices (optional)
        v. Determinants(optional)
12. Conic Sections
    a. Parabola
    b. Distance formula
    c. Midpoint formula
    d. Circle
    e. Hyperbola
    f. Ellipse
    g. Solving systems of nonlinear equations (optional)
    h. Solving systems of linear and nonlinear inequalities (optional)
13. Transcendental Functions
    a. Exponential functions
    b. Logarithmic functions
    c. Common logarithms

d. Natural logarithms
e. Properties of logarithms
f. Change of base formula
g. Solving exponential equations
h. Solving logarithmic equations

14. Introduction to Sequences and Series
    a. Arithmetic sequences
    b. Geometric sequences
    c. Series
    d. Partial sums of arithmetic and geometric series
    e. The Binomial Theorem

SAMPLE ASSIGNMENTS:

Reading

Writing

The following example is not intended to be an exhaustive list of assignments.

1. The student will be asked to describe how they would accomplish a specific algebraic operation. e.g. "Describe how you would 'Clear' the fractions from an equation."

Other

The following examples are not intended to be an exhaustive list of assignment problem types.

1. The student will be asked to:
2. Write and solve a linear equation in one variable to find the answers to a word problem.
3. Solve quadratic equations by factoring
4. Solve inverse variation problems

METHODS OF INSTRUCTION:

Methods of instruction may include, but are not limited to, the following: (from methods of instruction data page).

1. Dist Ed-Other
2. Internet-Delayed Inter
3. Lecture

METHODS OF EVALUATION:

A student's grade will be based on a required final examination and multiple measures of performance including critical thinking. These methods may include, but are not limited to the following:

A comprehensive final examination is required.

Other examinations, quizzes, homework and/or other assignments as determined by the instructor.

At least one method of evaluation will be used which will require the student to demonstrate critical thinking as evidenced through writing and/or problem solving skills.

TEXT BOOKS:

K. Elayn Martin-Gay. *Intermediate Algebra*. 5th Edition or Current Edition. Pearson Prentice Hall. 2009.

Margaret L. Lial,John Hornsby, Terry McGinnis. *Intermediate Algebra*. 9th Edition or current Edition. Pearson Addison Wesley. 2004.

MANUALS:

PERIODICALS:

SUPPLIES:

COMPARABLE COURSES:

Community College Course

American River College
Intermediate Algebra Math 120

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