## SECTION 1

### SUBJECT AREA AND COURSE NUMBER

HSDP 466

### COURSE TITLE

ALGEBRA 3-4, SECOND SEMESTER

### TYPE COURSE

NON-FEE                                        HSDP

### CATALOG COURSE DESCRIPTION

This two semester course complements and expands the mathematical content and concepts introduced in Algebra 3-4, first semester.  Algebra 4 covers systems of equations and inequalities, quadratic functions and their graphs, nonlinear inequalities, binomial theorum, sequences and series, and solid geometry.  The course includes application problems involving the topics covered.  (FT)

### LECTURE HOURS                                        LABORATORY

90

### ADVISORY

Successful completion of Algebra 3-4 first semester or equivalent.

### RECOMMENDED SKILL LEVEL

Mastery of the skills and objectives of Algebra 3-4, first semester.

### INSTITUTIONAL STUDENT LEARNING OUTCOMES

1. Social Responsibility
   SDCE students demonstrate interpersonal skills by learning and working cooperatively in a diverse environment.
2. Effective Communication
   SDCE students demonstrate effective communication skills.

## INSTITUTIONAL STUDENT LEARNING OUTCOMES (CONTINUED)

3. Critical Thinking
   SDCE students critically process information, make decisions, and solve problems independently or cooperatively.
4. Personal and Professional Development
   SDCE students pursue short term and life-long learning goals, mastering necessary skills and using resource management and self advocacy skills to cope with changing situations in their lives.

## COURSE GOALS

Completion of this course will allow students to master the California State Standards for Intermediate Algebra. Among these standards are: being adept at operation on polynomials, factoring polynomials, effects of coefficients on quadratic function graphs, graphing quadratic equations, determining whether a specific algebraic statement involving rational expressions, radical expressions or logarithmic, or exponential functions is sometimes, always or never true, relationship between geometry of the graph of conic section and coefficients, solving problems involving functional concepts, using negative exponents, proficiency with rational expressions and using operations with them, defining inverse functions and performing arithmetic operations on functions, identifying equations for circle, ellipse, parabola, or hyperbola, using fundamental counting principles to compute combinations and permutations, using combinations and permutations to compute probabilities, know the binomial theorem, apply method of mathematical induction, become proficient with arithmetic, finite and infinite geometric series, compute the variance and the standard deviation of a distribution of data.

## COURSE OBJECTIVES

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

1. Perform operations on polynomials, including long division.
2. Graph quadratic functions and determine maxima, minima, zeroes of function.
3. Demonstrate the effect that changing a coefficient has on the graph of quadratic functions.
4. Factor polynomials.
5. Determine whether a specific algebraic statement involves rational, radical, or logarithmic expressions.
6. Add, subtract, multiply, divide, reduce and evaluate rational expressions.
7. Solve problems involving functional concepts.
8. Demonstrate how the geometry of the graph of a conic section depends upon coefficients of the quadratic equation it represents.
9. Recognize whether quadratic equation represents circle, ellipse, parabola, or hyperbola.
10. Use fundamental counting principles to compute combinations and permutations.
11. Use combinations and permutations to compute probabilities.
12. Demonstrate the binomial theorem.
13. Find general term and the sums of arithmetic series and of both finite and infinite geometric series.
14. Derive summation formulas for arithmetic series and for both finite and infinite geometric series.

## SECTION II

### COURSE CONTENT AND SCOPE

1.  Identifying, Evaluating, Adding and Subtracting Polynomials
2.  Classifying Polynomials and Describing the Shapes of Their Graphs
3.  Identifying and Describing the Important Features of the Graph of a Polynomial Function
4.  Using a Polynomial Function to Model Real-World Data
5.  Multiplying and Factoring Polynomials
6.  Solving Polynomial Equations
7.  Using Rational Root Theorem and the Complex Conjugate Root Theorem to Find the Zeroes of a Polynomial Function
8.  Identifying Inverse, Joint and Combined Variations, Writing Equations for Variations, and Solving Real World Problems
9.  Multiplying and Dividing Rational Numbers
10. Adding and Subtracting Rational Expressions
11. Solving Rational Equations and Inequalities
12. Analyzing the Graphs of Radical Functions and Evaluating Radical Expressions
13. Simplifying Radical Expressions
14. Solving Radical Expressions and Inequalities
15. Classifying Conic Sections as the Intersection of a Plane and a Double Cone
16. Using the Distance and Midpoint Formula
17. Mastering Skills Needed to Identify, Graph Parabolas
18. Mastering Skills for Writing Equation, Graphing Circle
19. Mastering Skills Needed to Write Equation, Graph Hyperbolas
20. Solve Non Linear Systems
21. Master Skills of Counting Principles and Probability, Including Theoretical Probability, Permutations, Combinations, Addition with Probability, Independent Events, Dependent Events, Experimental Probability and Simulation
22. Mastering Series and Patterns, Including Sequence and Series, Arithmetic Sequence, Arithmetic Series, Geometric Sequence, Geometric Series and Mathematical Induction, Infinite Geometric Series, Pascal's Triangle, and Binomial Theorem
23. Probability and Statistics, Including Measures of Central Tendency, Stem and Leaf Plots, Histograms, Circle Graphs, Box and Whisper Plots, Measures of Dispersion, Binomial Distributions, Normal Distributions
24. Introduce Trigonometric Functions, Including Right Triangle Trigonometry, Angles of Rotation, Trigonometric Functions of Angles, Radian Measures and Arc Length, Graphing Trigonometric Functions and Inverse Trigonometric Functions
25. Examine Further Topics of Trigonometry, Including Laws of Sines, Cosines

### APPROPRIATE READINGS

Assigned text and supplemental readings.

### WRITING ASSIGNMENTS

Teachers may require portfolio or journal.

## OUTSIDE ASSIGNMENTS

Students are expected to spend 30 minutes outside of class for each lesson on:

1. Text readings
2. Assigned problems
3. Collecting data to solve real life problems (may include use of internet)

## APPROPRIATE ASSIGNMENTS THAT DEMONSTRATE CRITICAL THINKING

Students may be assigned data collection from real world and apply to skills learned in course.

## EVALUATION

Students will be evaluated through the use of three or more of the following:

1. Midterm and final exams
2. Unit tests or quizzes
3. Pre/post tests
4. Review of work completed
5. Class participation
6. Attendance

Upon successful completion of each individual course a Certificate of Course Completion will be issued. Upon successful completion of all courses included in the program a Certificate of Program Completion will be issued.

## METHOD OF INSTRUCTION

The primary methods of instruction will include, but not be limited to: lectures, individualized instruction, small group instruction, cooperative learning and field trips. This course, or sections of this course, may be offered through distance education.

## TEXTS AND SUPPLIES

*Holt Algebra* 2, Schultz and Ellis, current edition
*Guide to Teaching Intermediate Algebra*, San Diego Unified School District
SDUSD created workbooks

PREPARED BY: <u>MAXINE SHERARD/JOHN SULLIVAN</u>     DATE:  <u>July 1982</u>

DATA REVISED BY: <u>HEIKO FREDERICKS</u>     DATE:  <u>SEPTEMBER 1985</u>

DATA REVISED BY: <u>GARY GLECKMAN</u>     DATE:  <u>FEBRUARY 10, 2007</u>

DATA REVISED BY  <u>Instructional Services/SLO's Added</u>     DATE  <u>December 20, 2013</u>

Instructors must meet all requirements stated in Policy 3100 (Student Rights, Responsibilities and Administrative Due Process), and the Attendance Policy set forth in the Continuing Education Catalog.

<u>REFERENCES:</u>

San Diego Community College District Policy 3100
California Community Colleges, Title 5, Section 55002
Continuing Education Catalog