

SAN DIEGO COMMUNITY COLLEGE DISTRICT
CONTINUING EDUCATION
COURSE OUTLINE

SECTION I

SUBJECT AREA AND COURSE NUMBER

HSDP 501

COURSE TITLE

PRE-ALGEBRA, SEMESTER 2

TYPE COURSE

NON-FEE

HSDP

CATALOG DESCRIPTION

This is the second semester of a two semester course designed to prepare the student for success in a college preparatory sequence of mathematics courses. The student masters prealgebraic skills and concepts as a foundation for Algebra 1. (FT)

LECTURE HOURS

90

LABORATORY HOURS

ADVISORY

Successful completion of Pre-Algebra, Semester 1 or equivalent.

RECOMMENDED SKILL LEVEL

Ability to perform the skills required to pass Pre Algebra Semester 1 (in the areas of Data Analysis, One Step Equations and Inequalities, Decimals and Equations, Factors, Fractions and Exponents).

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

By the end of this course, students will: Demonstrate mastery of the skills introduced in the first semester of Pre Algebra. Graph linear functions and understand the idea of slope and its relation to ratio. Know the Pythagorean Theorem and solve problems in which they compute the length of the unknown side. Know how to compute the surface area and volume of basic three dimensional objects and understand how area and volume change with a change in scale.

COURSE OBJECTIVES

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

1. Demonstrate knowledge of the properties of, and compute with rational numbers expressed in a variety of forms.
2. Use exponents, powers, and roots and use exponents in working with fractions.
3. Express quantitative relationships by using algebraic terminology, expressions, equations, inequalities, and graphs.
4. Interpret and evaluate expressions involving integer powers and simple roots.
5. Graph and interpret linear and some nonlinear functions.
6. Solve simple linear equations and inequalities over the rational numbers.
7. Choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems.
8. Compute the perimeter, area and volume of common geometric objects and use the results to find measure of less common objects.
9. Demonstrate how perimeter, area, and volume are affected by changes of scale.
10. Demonstrate the Pythagorean Theorem and understanding of plane and solid geometric shapes by constructing figures that meet given conditions and by identifying attributes of figures.
11. Collect, organize and represent data sets that have one or more variables.
12. Make decision about how to approach problems.
13. Use strategies, skills, and concepts in finding solutions.
14. Determine a solution is complete and move beyond a particular problem by generalizing to other situations.

SECTION II

COURSE CONTENT AND SCOPE

1. Operations with Fractions
 - 1.1. Add, subtract, multiply, divide fractions; add, subtract, multiply to solve equations involving fractions
 - 1.2. Convert terminating decimals to reduced fractions
 - 1.3. Add and subtract fractions using factors to find common denominator
 - 1.4. Simplify rational numbers by using exponent rules
 - 1.5. Find powers of products and quotients
2. Ratios, Proportions and Percents
 - 2.1. Solve percent problems using proportions and equations
 - 2.2. Convert percents to reduced fractions
 - 2.3. Calculate the percentage of increase and decrease of a quantity
 - 2.4. Solve problems that involve discounts, markups, and find commissions
 - 2.5. Use proportions and dimensions to find indirect measurement
 - 2.6. Solve multi-step problems involving distance
3. Solving Equations and Inequalities
 - 3.1. Write an equation
 - 3.2. Solve multi-step equations with fractions and decimals; solve multi step equations with variables on both sides; solve two-step inequalities
 - 3.3. Find simple and compound interest
4. Linear Functions and Graphing
 - 4.1. Write linear equations
 - 4.2. Graph equations with two variables, graph linear inequalities
 - 4.3. Graph linear functions; use slope and y-intercept to graph linear functions
 - 4.4. Plot values of quantities whose ratios are always the same in order to understand slope
 - 4.5. Write function rule to find commission
 - 4.6. Represent two variables using a scatter plot; use scatter plots to find trend lines and equations for trend lines
5. Spatial Thinking
 - 5.1. Identify and construct basic elements of geometric figures by using a compass and a straight edge
 - 5.2. Understand and use coordinate points graphs to plot simple figures, determine lengths and areas related to them, and determine their image under translations and reflections
 - 5.3. Demonstrate an understanding of conditions that indicate two geometrical figures are congruent and what congruence means about the relationships between the sides and angles of the two figures
 - 5.4. Identify elements of three dimensional geometric objects and describe how two or more objects are related in space
6. Area and Volume
 - 6.1. Use formulas to find area of basic two dimensional figures and the surface area and volume of basic three dimensional figures
 - 6.2. Estimate and compute area of more complex or irregular two and three dimensional figures by breaking the figures down into more basic geometric figures

COURSE CONTENT AND SCOPE (CONTINUED)

- 6.3. Understand the effects on surface area when side lengths are multiplied by a scale factor
- 6.4. Identify elements of three dimensional objects
- 7. Right Triangles in Algebra
 - 7.1. Know and understand the pythagorean theorem and its converse and use it to find the length of the missing side of a right triangle and the lengths of other line segments and, in some situations, empirically verify the pythagorean theorem by direct measurement
 - 7.2. Classify real numbers
 - 7.3. Find square roots
- 8. Nonlinear Functions and Polynomials
 - 8.1. Evaluate variable expressions
 - 8.2. Add and subtract variable expressions; simplify using the distributive property; use distributive property to multiply binomials
 - 8.3. Graph nonlinear functions
 - 8.4. Plot values for volumes of cubes with various edge lengths
 - 8.5. Compare measures in the metric system
 - 8.6. Analyze number patterns to determine sequences
 - 8.7. Apply strategies from simpler problems to more complex problems

APPROPRIATE READINGS

NONE

WRITING ASSIGNMENTS

NONE

OUTSIDE ASSIGNMENTS

Students are expected to spend an average of 30 minutes outside study for each class lesson. Assignments may include, but not necessarily be limited to:

- 1. Completion of assigned problem sets.
- 2. Studying textbook material.
- 3. Preparing for unit examinations.
- 4. Researching assigned problems (either with a group, individual, using internet).

APPROPRIATE ASSIGNMENTS THAT DEMONSTRATE CRITICAL THINKING

Students will be required to select and apply appropriate problem solving strategies to solve verbal problems, either individually or in a group.

EVALUATION

Student performance assessment will be based upon, but not necessarily limited to, periodic quizzes, unit examinations, completion of written assignments (or packet work), and attendance and participation in class.

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

Lectures, instructor guided discussions, individual tutoring, cooperative learning in peer groups will assist the students in successfully completing their work. In addition, individual work packets may be used to facilitate small group work and self-paced work. This course, or sections of this course, may be offered through distance education.

TEXTS AND SUPPLIES

Pre-Algebra California Edition, Prentice Hall, current edition
Pre Algebra: A Transition to Algebra, Glencoe, current edition
Teacher's Guide and Student Work Packets, San Diego City Schools
Mathematical Connections: A Bridge to Algebra and Geometry, Gardella, Houghton, Mifflin
SkillsTutor software

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DATE REVISED: GARY GLECKMAN DATE: FEBRUARY 9, 2007

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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.

REFERENCES:

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