



CATALOG DESCRIPTION

Instructs students in the knowledge of linear, piecewise, quadratic, polynomial, rational, inverse, exponential, and logarithmic functions; function topics include finding the average rate of change, analyzing graphs, graphing using transformations, finding roots in the real and complex number systems, and constructing functions to model real-world applications. Other topics include systems of linear equations and inequalities, matrices, linear programming, sequences and series.

Prerequisites: Accuplacer score of 104-120 or grade of "C" or better in MATH 115

Semester Offered: Fall, Spring and Summer

Common Student Learning Outcomes

Upon successful completion of San Juan College programs and degrees, the student will demonstrate competency in...

BROAD AND SPECIALIZED LEARNING

Students will actively and independently acquire, apply, and adapt skills and knowledge with an awareness of global contexts.

CRITICAL THINKING

Students will think analytically and creatively to explore ideas, make connections, draw conclusions and solve problems.

CULTURAL AND CIVIC ENGAGEMENT

Students will act purposefully, reflectively, and ethically in diverse and complex environments.

EFFECTIVE COMMUNICATION

Students will exchange ideas and information with clarity in multiple contexts.

INFORMATION LITERACY

Students will be able to recognize when information is needed and have the ability to locate, evaluate, and use it effectively.

INTEGRATING TECHNOLOGIES

Students will demonstrate fluency in the application and use of technologies in multiple contexts.

Student work from this class may be randomly selected and used anonymously for assessment of course, program, and/or institutional learning outcomes. For more information, please refer to the Dean of the appropriate School.

Course Learning Outcomes

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

1. Functions and Graphs
2. Linear and Quadratic equations and functions
3. Polynomial and rational functions
4. Exponential and logarithmic functions
5. Linear systems and inequalities
6. Sequences and Series
7. Computer/Calculator usage

Specific Learning Outcomes

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

- 1.1 determine whether a relation represents a function
- 1.2 find the value of a function
- 1.3 find the domain of a function
- 1.4 form the sum, difference, product and quotient of 2 functions
- 1.5 find the average rate of change of a function
- 1.6 graph piecewise-defined functions
- 1.7 graph functions using vertical and/or horizontal shifts, compression or stretching and reflections
- 1.8 construct and analyze functions

- 2.1 identify and graph linear functions
- 2.2 use average rate of change to identify linear functions
- 2.3 solve applications of linear functions
- 2.4 construct a linear model using direct variation
- 2.5 recognize quadratic functions from the graphical and algebraic representation
- 2.6 solve quadratic equations algebraically using factoring, square root method, completing the square, and the quadratic formula.
- 2.7 find the vertex, axis of symmetry and intercepts of a quadratic function
- 2.8 find the maximum or minimum value of quadratic functions
- 2.9 solve applied problems by building quadratic functions
- 2.10 find the complex zeros of a quadratic function
- 2.11 find the vertex of a parabola algebraically and graphically
- 2.12 solve equations that are quadratic in form

- 3.1 identify and visualize the general shape of a given polynomial function
- 3.2 identify the zeros of a polynomial function and their multiplicity
- 3.3 analyze and graph polynomial functions
- 3.4 find the domain of a rational function
- 3.5 find the vertical and horizontal asymptotes of a rational function
- 3.6 solve polynomial and rational inequalities
- 3.8 form a polynomial function with specified zeros

- 4.1 form composite functions
- 4.2 find the domain of a composite function
- 4.3 determine whether a function is One-to-One
- 4.4 find the inverse of a function defined by an equation, graph, or ordered pairs
- 4.5 evaluate and graph exponential and logarithmic functions
- 4.6 convert between exponential and logarithmic expressions
- 4.7 determine the domain and range of exponential and logarithmic functions
- 4.8 solve logarithmic and exponential equations
- 4.9 solve applications modeled by exponential functions

- 5.1 solve systems of equations with 2 or 3 unknowns by substitution and elimination methods
- 5.2 use systems of equations to solve applied problems
- 5.3 solve linear programming problems

- 6.1 find any term in a sequence when given a formula for the n th term of the sequence
- 6.2 find the sum of an indicated number of terms in a summation
- 6.3 solve basic applied problems involving sequences and series

7.1 utilize a graphing calculator to view and/or discuss above objectives

OTHER REQUIREMENTS:

A **TI-83 Plus or TI-84 Plus Graphing Calculator** is required for the course. Graphing calculators capable of symbolic manipulation (such as TI-89 or TI-92 and other such calculators) will not be allowed on examinations.