SAN JUAN COLLEGE
Success Matters

MATH-1250 TRIGONOMETRY & PRE-CALCULUS 5 CREDITS

SYLLABUS

CATALOG DESCRIPTION

Trigonometry & Pre-Calculus includes the study of functions in general with emphasis on the elementary functions: algebraic, exponential, logarithmic, trigonometric and inverse trigonometric functions. Topics include rates of change, limits, systems of equations, conic sections, sequences and series, trigonometric equations and identities, complex number, vectors, and applications.

Prerequisites: High School Algebra II course grade of C or better, GPA of 3.4 or higher or

Co-requisite: High School Algebra I course grade of C or better, GPA of 2.8 or higher enroll in LRNS: 299.

Semester Offered: Fall, Spring

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…

Trigonometry Student Learning Outcomes

1. Students will be able to define and evaluate the trigonometric functions as functions of angle in both degree and radian measure using the definitions in terms of x, y, and r; as the ratio of sides of a right triangle; using the unit circle; using reference angles, commonly used (0 o, 30 o, 45 o, 60 o, 90o) angles and using a calculator.
2. Students will be able to solve right triangles. They will be able to draw a sketch in an applied problem when necessary.
3. Students will be able to solve non-right triangles using the law of sines and the law of cosines.
4. Students will be able to prove trigonometric identities and apply addition and subtraction, double-angle, half-angle and power reduction formulas.
5. Students will be able to graph the six trigonometric functions, their transformations and their inverses.
6. Students will be able to use algebraic methods, including the use of identities and inverses, to solve trigonometric equations and demonstrate connections to graphical and numerical representations of the solutions.
7. Students will be able to add and subtract vectors in two dimensions. They will be able to use the dot product to project one vector onto another and to determine the angle between two vectors. They will be able to solve a variety of word problems using vectors.
8. Students will be able to work with polar coordinates; this includes graphing in polar coordinates and transforming an equation with polar coordinates into one with rectangular coordinates, and vice versa.
9. Students will be to work with the trigonometric form of complex numbers, including using De Moivre's formula.

Pre-Calculus Student Learning Outcomes

1. Functions
    a. Reinforce recognizing a function from its graph and from its algebraic expression.
    b. Reinforce identification of a one-to-one function graphically and from its algebraic expression.
    c. Reinforce identification of inverse functions graphically and algebraically.
    d. Reinforce combining functions arithmetically and compositionally.
    e. Be able to calculate the average rate of change of a function using the difference quotient and depict it graphically.
    f. Be able to find a limiting value of a function and be able to identify and use the notation that describes this:
2. Graphing
    a. Reinforce using key characteristics of functions to graph them.
    b. Be able to graph conic sections from their key characteristics such as foci, eccentricity and asymptotes.
    c. Be able to identify all functions mentioned from their graphs, describing their key aspects.
3. Solving
    a. Exponential/Logarithmic equations using the rules of exponents and logarithms
    b. Systems of linear equations by elimination.
    c. Non-linear systems algebraically and graphically.
4. Applications
    a. Modeling with functions with an emphasis on exponential and logarithmic functions, growth and decay.
5. Sequences and series
    a. Understand the concept and notation of a sequence.
    b. Understand the concept and notation of a series.
    c. Be able to find limits of basic sequences.
    d. Be able to find sums of basic series.