

MINNESOTA WEST COMMUNITY & TECHNICAL COLLEGE

COURSE OUTLINE

DEPT. MATH

COURSE NUMBER: 1113

NUMBER OF CREDITS: 4

Lecture: 4 Lab: 0 OJT: 0

Course Title:

Precalculus

Catalog Description:

Precalculus reviews the concepts of college algebra and then extends those ideas to trigonometry and analytic geometry. Exponential, logarithmic, and polynomial functions are emphasized in the review. The course explores rectangular coordinates and angles, solutions of right triangles, unit circles, radian measure, trigonometric functions and their inverses, trigonometric graphs, trigonometric equations and identities, complex numbers, conic sections, and other analytic geometry topics such as polar coordinates, parametric equations, sums and geometric series, and vectors.

Prerequisites or Necessary Entry Skills/Knowledge:

MATH 1111 or placement by multiple measures.

FULFILLS MN TRANSFER CURRICULUM AREA(S) (*Leave blank if not applicable*)

- ☒ Goal 4: Mathematics/Logical Reasoning: By meeting the following competencies:
- Illustrate historical and contemporary applications of mathematics/logical systems.
 - Clearly express mathematical/logical ideas in writing.
 - Explain what constitutes a valid mathematical/logical argument (proof).
 - Apply higher-order problem-solving and/or modeling strategies.

Topics to be Covered

Concept of a function and their graphs

Function notation, including piecewise defined functions and absolute value functions

Proportionality, rates, and rates of change

Linear functions and data modeling

Complex numbers

Fundamental Theorem of Algebra

Polynomial, power, and rational functions

Transformations of functions and their graphs

Compositions, Inverses, and Combinations of functions

Exponential and logarithm functions and modeling

Trigonometric functions of real numbers

The unit circle concept and trigonometric graphs

Inverse Trig functions

Trigonometric functions of angles and right triangle definitions
Trigonometric identities, equations, and modeling periodic behavior
Law of Sines and Cosines
Vectors and the Dot product
Polar coordinate system
Polar equations of conics
Parametric equations
Trig form of complex numbers
Systems of Equations of two and several variables
Systems of inequalities
Systems of linear equations and matrices
Inverses of matrices and matrix equations
Determinants and Cramer's Rule
Conic Sections—parabolas, ellipses, hyperbolas
Arithmetic sequences and series
Geometric series and applications
Mathematical Induction
Partial Fractions

Student Learning Outcomes

Define algebraic and trigonometric concepts in four ways: verbally, analytically, numerically and visually.

Demonstrate skills to solve equations and inequalities and to simplify or expand expressions.

Recognize and apply different types of functions and relations.

Recognize and apply different types of functions and relations. Implement functions and relations to model real-world applications and predict outcomes from modeling data.

Communicate mathematical ideas in writing.

Is this course part of a transfer pathway: Yes ☐ No ☒

**If yes, please list the competencies below*

Revised Date: 12/1/2021