MINNESOTA WEST COMMUNITY & TECHNICAL COLLEGE
COURSE OUTLINE

DEPT. MATH   **COURSE NUMBER: 1111**

NUMBER OF CREDITS: 3   **Lecture: 3 Lab: 0   OJT: 0**

Course Title:
College Algebra

Catalog Description:
College Algebra reviews the fundamental operations of higher algebra integrated with a functions approach. Studies polynomial, exponential, and logarithmic functions, graphs and transformations, systems of equalities and inequalities, matrices and determinants, problem solving applications and data modeling techniques.

Prerequisites or Necessary Entry Skills/Knowledge:
MATH 1107, MATH 1105, Co-requisite MATH 0111 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:
1. Illustrate historical and contemporary applications of mathematical/logical systems.
2. Clearly express mathematical/logical ideas in writing.
3. Explain what constitutes a valid mathematical/logical argument (proof).
4. Apply higher-order problem-solving and/or modeling strategies.

Topics to be Covered
Equations and Inequalities
The Cartesian Plane and Graphs
Functions and Graphs
Quadratic Functions
Polynomial and Rational Functions
Exponential and Logarithmic Functions
Systems of Equations and Inequalities
Matrices and Determinants
Sequences and Series

Student Learning Outcomes

1. Students will develop the use of algebraic expressions to solve authentic problems.
    A. Evaluate algebraic expressions and formulas.
    B. Solve equations and inequalities of the following types: linear, absolute value, quadratic, polynomial, rational, power, exponential and logarithmic.

C. Estimate solutions and evaluate reasonableness for solutions.

2. Students will use mathematical models to understand mathematical patterns.
    A. Translate between written English and mathematical terminology, concepts and notation.
    B. Recognize and identify variable and constant effects on patterns.
    C. Transfer patterns between numeric expressions and algebraic expressions.

3. Students will develop a higher level of mathematical thinking using inductive and deductive reasoning.
    A. Identify and write equivalent algebraic expressions.
    B. Use algorithms to perform a given calculation or solve a given problem.
    C. Use inductive reasoning to identify missing terms in numerical and graphical patterns.
    D. Use deductive reasoning to draw conclusion and evaluate arguments.

4. Students will develop methods to organize data and analyze problems.
    A. Identify which type(s) of functions can model data presented in tabular or graphical format.
    B. Identify which equation or functions best fit or represent a set of data in tabular or graphical form.
    C. Use technology to find an appropriate model for data.

5. Students will use multiple representations including algebraic, geometric, graphical, verbal and numerical methods where possible.
    A. Use multiple representations to describe authentic situations, data, and patterns.
    B. Graph ordered pairs (relations), functions and use graphs to describe situations, functions and patterns.
    C. Solve problems using multiple representations.

6. Complete Competencies 17 - 20 for Teachers of Elem. Ed. (8710.3200, Subp. 3, Standard H7a, H7b, H7c, H7d) As follows:
    A. Know and apply mathematical processes,
    B. Reason mathematically, solve problems, and communicate mathematics effectively at different levels of formality,
    C. Understand the connections among mathematical concepts and procedures, as well as their application to real world,
    D. Understand the relationship between mathematics and other fields,
    E. Understand and apply problem solving, reasoning, communication, and connections.

Is this course part of a transfer pathway: Yes ☐   No ☒
*If yes, please list the competencies below

Revised Date: 4/5/2022