COURSE OUTLINE

TITLE: Foundations of Mathematics II MATH-115 (4)-4 Mott CC

CATALOG DESCRIPTION:
This course is intended for students who need algebraic and statistical skills for applications in varied careers. Topics will include linear equations and inequalities, quadratic and exponential equations, operations with polynomials, functions, introduction to probability, descriptive statistics, systems of equations and matrices, sequences and series, and the use of technology in mathematics.

OBJECTIVE(S):

- Develop an understanding of basic mathematical methods for non-STEM majors
- Develop a sense of proportional reasoning and improve mathematical literacy
- Use appropriate algebraic methods to formulate and solve applications
- Solve applications that are linear, quadratic, and exponential in nature
- Determine probability of events
- Analyze data using sound statistical principles
- Represent data in an organized, meaningful manner

Prerequisite: Successful completion of MATH-072 or MATH-082 with 2.0 or higher or placement into MATH-115.

COURSE CONTENT:

Review Topics
- Real numbers
- Algebraic expressions (evaluating)
- Algebraic expressions (simplifying)

Proportional Reasoning
- Rates of change and slopes of lines
- Ratios, proportions, percents, and variation
- Graphs of linear equations in two variables
- Equation of a line (slope-intercept form)
- Formulas (including rearrangement of formulas)

Algebra Essentials
- Exponents (integer and rational)
- Operations with polynomials
- Factoring (common factors, difference of two squares, simple trinomials)

Mathematical Models

- Linear, quadratic, and exponential functions
- Rational, radical, and logarithmic functions
- Solving applications by modeling with functions
- Domain of functions
- Evaluation of functions for given values
- Algebra with functions

Statistical and Probability Methods

- Statistical methods for collecting, organizing and presenting data
- Statistical graphs and distributions (bar graphs, histograms, pie charts, stem and leaf displays, scatter plots, line graphs)
- Measures of central tendency (mean, median, mode, weighted mean)
- Measures of variation (standard deviation and variance)
- Measures of relative position (percentiles and quartiles)
- Sets and logic (AND, OR, NOT statements)
- Counting, permutations, and combinations
- Unions and intersections of events
- Sample space
- Probability of events
- Probability trees and distributions
- Binomial distribution
- Normal distribution

Technology Integration

- Computations with technology
- Generation of tables and graphs
- Descriptive measures in statistics
- Regression and curve fitting (matching data with mathematical models)

Optional Topics as Appropriate

- Linear inequalities
- Systems of linear equations and inequalities
- Sequences and series (arithmetic and geometric)
- Linear programming
- Operations with matrices
- Inverses of functions

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