COURSE OUTLINE: MTH146 - MATHEMATICS

Prepared: Mathematics Department
Approved: Martha Irwin - Dean

Course Code: Title	MTH146: MATHEMATICS
Program Number: Name	4039: MECH. ENG. TN-MANUFA 4080: CIVIL ENG TECHNICIAN
Department:	MATHEMATICS
Academic Year:	2025-2026
Course Description:	By the end of this course students will have demonstrated the ability to graph, describe, and evaluate quadratic, exponential, and logarithmic functions. Algebraic properties will be applied to expressions with rational exponents and radicals. Students will use numerical methods along with graphs charts, and tables to effectively describe data. Critical thinking and problem-solving skills will be developed through exposure to applied problems involving probability, normal distribution, and statistical process control.
Total Credits:	4
Hours/Week:	4
Total Hours:	56
Prerequisites:	MTH145
Corequisites:	There are no co-requisites for this course.
Substitutes:	MTH143, MTH613
Essential Employability Skills (EES) addressed in this course:	EES 3 Execute mathematical operations accurately. EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 10 Manage the use of time and other resources to complete projects.
Course Evaluation:	Passing Grade: 50%, D A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
Books and Required Resources:	Calculator-Sharp EL-520 (available in the bookstore)

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Factor algebraic expressions.	1.1 Factor expressions by removing common factors. 1.2 Factor binomials that are the difference of squares. 1.3 Factor trinomials.
Course Outcome 2	**Learning Objectives for Course Outcome 2**

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2. Solve quadratic equations and graph quadratic functions.	2.1 Describe quadratic equations and functions. 2.2 Solve quadratic equations by factoring. 2.3 Solve quadratic equations by completing the square. 2.4 Solve quadratic equations using the Quadratic Formula 2.5 Graph quadratic functions using the vertex, x-y intercepts, and the axis of symmetry.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Simplify and evaluate expressions involving rational exponents and radicals.	3.1 Convert between fractional exponents and radicals. 3.2 Simplify expressions with rational exponents. 3.3 Simplify radicals by removing perfect powers and by rationalizing the denominator. 3.4 Add, subtract, multiply, and divide radicals.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Define, graph, simplify, and solve equations involving exponential and logarithmic functions.	4.1 Define logarithmic and exponential functions. 4.2 Graph logarithmic and exponential functions. 4.3 Convert expressions between exponential and logarithmic form. 4.4 Solve logarithmic equations by converting to exponential form. 4.5 Solve exponential equations by applying the power law of logarithms.
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. Organize and analyze data using frequency distributions, statistical measures, and regression techniques, calculate event probabilities, interpret the standard normal distribution for inference, and apply statistical process control to real-world problems.	5.1 Organize data into frequency distributions, frequency histograms or frequency polygons. 5.2 Calculate the mean, median and mode for a set of data. 5.3 Calculate the range and standard of deviation for a set of data. 5.4 Determine the probability of a simple event. 5.5 Explain the concept of the standard normal distribution, how it relates to standard deviation, and its importance for inference. 5.6 Calculate event probabilities based on transforming raw scores to z-scores. 5.7 Apply statistical process control to real world problems. 5.8 Recognize and describe types of correlation. 5.9 Apply the principles of linear and non-linear regression to practical examples such as predictive and preventative scenarios.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments and Quizzes	30%
Tests	70%

Date: July 31, 2025

Addendum: Please refer to the course outline addendum on the Learning Management System for further information.

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