COURSE OUTLINE: MTH146 - MATHEMATICS

Prepared: Mathematics Department
Approved: Sherri Smith, Chair, Natural Environment, Business, Design and Culinary

Course Code: Title	MTH146: MATHEMATICS
Program Number: Name	4039: MECH. ENG. TN-MANUFA 4080: CIVIL ENG TECHNICIAN
Department:	MATHEMATICS
Semesters/Terms:	18F
Course Description:	This course is a continuation of MTH145. Topics of study include variation, geometric applications that use variation and modeling, statistics, a more detailed view of exponents and radicals, quadratics, exponential and logarithmic functions. The goals of this course are, first, to show that mathematics does play a most important role in the development and understanding of the various fields of technology and, second, to ensure that students acquire the mathematical and critical thinking skills necessary to analyze and solve engineering technology problems.
Total Credits:	4
Hours/Week:	4
Total Hours:	60
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
Other Course Evaluation & Assessment Requirements:	Evaluation will consist of two components: Tests overall worth of 80 % toward the final grade. Homework assignments, in-class assignments, quizzes overall worth of 20% toward the final grade. Students must pass both the assigned work and test portion of the course to pass the entire course. There will likely be 4 to 5 tests during the semester and the dates will be identified in class. Each test will be worth the same weight towards the final test score. Each test will have the same worth and weight towards the final test portion of the score. The professor reserves the right to adjust the number of tests, assignments and quizzes as warranted. Any modifications will be discussed in class. Students with special needs and or

circumstances are required to identify with the professor.

Attendance is mandatory and the quizzes, in-class assigned work will only be marked when completed in class.

It is the student`s responsibility to notify the professor in advance of any absences and it will be at the professor`s discretion to allow rewrites, retakes, modified assignments or quizzes where warranted.

Work is to be completed by the assigned dates and times. Failure to do so may result in zero grades for the assigned work.

Some assignments must be completed within the assigned class time. Failure to attend the class may result in a zero grade or partial grades at the professor`s discretion.

Books and Required Resources:	Basic Technical Mathematics with Calculus and MyMathLab software (10th Edition) Washington, SI Version ISBN-10: 0133523 by Washington and Boue Publisher: Pearson Edition: 10 ISBN: 9780133523669

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Variation	1.1 Work with ratios and proportions of like and unlike units of measure. 1.2 Define what constants and variants are. 1.3 Study direct, inverse and joint variation. 1.4 Work with constants, variants and solve equations.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Geometric applications using variation and modeling	2.1 Solve practical problems to find the sides and angles of right triangles. 2.2 Solve practical problems to find the areas of a triangle or quadrilateral. 2.3 Solve problems involving the circumference, diameter, area or tangent to a circle. 2.4 Compute surface areas and volumes of spheres, cylinders, cones and other solid figures. 2.5 Use geometric proportional models and variance to solve practical problems of determining lengths, perimeter, area and volume.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Statistics, probability and data analysis	3.1 Organize data into frequency distributions, frequency histograms or frequency polygons. 3.2 Define the various measures of central tendency such as arithmetic mean, median, and mode. 3.3 Calculate the arithmetic mean, median and mode when given specific data. 3.4 Study normal distribution and how it relates to determining standard deviation. 3.5 Calculate the range and standard deviation. 3.6 Define probability and how it relates to practical problem solving in real world applications. 3.7 Analyze data to determine probable trends. 3.8 Apply statistical process control to real world problems.

		3.9 Apply the principles of linear and non-linear regression to practical examples such as predictive and preventative scenarios.
	Course Outcome 4	**Learning Objectives for Course Outcome 4**
	4. Exponents and radicals	4.1 Use the laws of exponents to simplify and combine expressions having integral exponents. 4.2 Work with fractional exponents. 4.3 Simplify radicals. 4.4 Apply mathematical operations to radicals.
	Course Outcome 5	**Learning Objectives for Course Outcome 5**
	5. Quadratic equations	5.1 Describe the quadratic equation. 5.2 Solve quadratic equations by factoring. 5.3 Solve quadratic equations by completing the square. 5.4 Use the quadratic formula to solve for the unknowns. 5.5 Graphing the quadratic function. 5.6 Identify the parabolic shape and direction of the graph. 5.7 Identify the vertex and x/y intercepts of the graphed parabola.
	Course Outcome 6	**Learning Objectives for Course Outcome 6**
	6. Exponential and logarithmic functions	6.1 Define the exponential and logarithmic functions. 6.2 Graph logarithmic and exponential functions. 6.3 Identify the properties of logarithms. 6.4 Convert expressions between exponential and logarithmic form. 6.5 Work with common and natural logarithms. 6.6 Solve exponential and logarithmic equations.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight	Course Outcome Assessed
Assigned Work	20%	
Tests	80%	

Date:

July 11, 2018

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