



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:	19F, 20W
Course Description:	<p>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.</p> <p>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.</p>
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:	<p>Evaluation will consist of four topic tests each contributing a 25% weight of the final average.</p> <p>Students with special needs and or circumstances are required to identify with the professor. 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 an alternative test time. Failure to do so may result in a zero grade for missed tests.</p>
Books and Required Resources:	<p>Basic Technical Mathematics with Calculus by Washington and Boue Publisher: Pearson Edition: 11 ISBN: 9780134289915</p> <p>Calculator -</p>



SAULT COLLEGE | 443 NORTHERN AVENUE | SAULT STE. MARIE, ON P6B 4J3, CANADA | 705-759-2554

Sharp EL-520XTB (available in the bookstore)

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
Test 1 (outcome 1 and 2)	25%
Test 2 (outcome 3 and 4)	25%
Test 3 (outcome 5)	25%
Test 4 (outcome 6)	25%

Date:

June 19, 2019

Addendum:

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

