COURSE OUTLINE: MTH612 - MATHEMATICS

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

Course Code: Title	MTH612: MATHEMATICS
Program Number: Name	4061: AVIATION TECHNOLOGY
Department:	MATHEMATICS
Semesters/Terms:	18F
Course Description:	Students will develop skills needed to solve problems in technical mathematics. Topics include a detailed review of algebra followed by a study of quadratic equations, exponential and logarithmic functions and trigonometric functions.
Total Credits:	4
Hours/Week:	4
Total Hours:	60
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Substitutes:	MTH143
This course is a pre-requisite for:	AFT120, AVF122, AVT123, ELR104, 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.
Course Evaluation:	Passing Grade: 50%, D
Books and Required Resources:	Basic Technical Calculus with Analytic Geometry by A. J. Washington Publisher: Pearson Edition: 10

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Functions:	1.1 Distinguish a function from other mathematical expressions or equations. 1.2 Make a graph of some common families of functions.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Trigonometric Functions:	2.1 Convert decimal degrees to degrees, minutes, seconds, and also to revolutions. 2.2 Define six trigonometric ratios and calculate ratios and angles involving right triangles.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Systems of Linear Equations:	3.1 Solve systems of two linear equations graphically. 3.2 Solve systems of two linear equations by elimination.

	3.3 Solve systems of two linear equations by comparison. 3.4 Solve systems of two or three linear equations using determinants. 3.5 Solve word problems involving linear equations with two or three variables.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Factoring and Fractions:	4.1 Use factoring methods of common factoring, difference of squares, trinomials and sum and difference of cubes factoring. 4.2 Add, subtract, multiply and divide algebraic fractions. 4.3 Solve fractional equations.
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. Quadratic Equations:	5.1 Solve quadratic equations using the methods of factoring, the square root method, completing the square and the quadratic formula. 5.2 Graph quadratic functions by finding the vertex and the x and y intercepts.
Course Outcome 6	**Learning Objectives for Course Outcome 6**
6. Trigonometric Functions of any Angle:	6.1 Understand and use the CAST rule. 6.2 Use trigonometry to solve problems involving angles in any quadrant. 6.3 Explain what a radian is and convert degrees to radians and vice-versa. 6.4 Solve problems involving angles in radian measure.
Course Outcome 7	**Learning Objectives for Course Outcome 7**
7. Vectors and Oblique Triangles:	7.1 Add and subtract vectors graphically and identify the component and resultant vectors. 7.2 Add and subtract vectors algebraically using a vector chart. 7.3 Solve problems involving right triangles and vectors. 7.4 Use the sine and cosine law to solve problems involving oblique triangles.
Course Outcome 8	**Learning Objectives for Course Outcome 8**
8. Graphs of Trigonometric Functions:	8.1 Determine the amplitude, period and phase shift of a given trig function. 8.2 Make a sketch of any of the six trig functions studied. Include two periods.
Course Outcome 9	**Learning Objectives for Course Outcome 9**
9. Exponents and Radicals:	9.1 Study and apply the rules of exponents and simplify algebraic expressions involving exponents. 9.2 Write exponential expressions in radical form and vice-versa. 9.3 Perform algebraic operations on radical expressions including the conjugate radical.
Course Outcome 10	**Learning Objectives for Course Outcome 10**
10. Exponential and Logarithmic Functions:	10.1 Study and apply the properties of logarithms by expanding and simplifying logarithmic

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	expressions. 10.2 Solve logarithmic and exponential equations.
Course Outcome 11	**Learning Objectives for Course Outcome 11**
11. Additional Types of Systems of Equations:	11.1 Recognize equation forms of circles, parabolas, ellipses and hyperbolas. 11.2 Solve systems of equations of first and second degree.
Course Outcome 12	**Learning Objectives for Course Outcome 12**
12. Inequalities:	12.1 Solve problems involving linear and non-linear inequalities. Draw a number line to show the solution. Use a factor chart for equations of second degree and higher.
Course Outcome 13	**Learning Objectives for Course Outcome 13**
13. Variation:	13.1 Define the terms ratio and proportion. 13.2 Reduce a ratio to lowest terms. 13.3 Solve ratio and proportion problems. 13.4 Write equations indicating direct, joint and inverse variation. 13.5 Solve word problems involving variation.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight	Course Outcome Assessed
Test 1	25%	all
Test 2	25%	all
Test 3	25%	all
Test 4	25%	all

Date: June 25, 2018

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