COURSE OUTLINE

MTH612

Prepared: Mathematics Department   Approved: Sherri Smith

Course Code: Title	MTH612: MATHEMATICS
Program Number: Name	4061: AVIATION TECHNOLOGY
Department:	MATHEMATICS
Semester/Term:	17F
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
Substitutes:	MTH143
This course is a pre-requisite for:	AFT120, AVF122, AVT123, ELR104, MTH613
Essential Employability Skills (EES):	#3. Execute mathematical operations accurately. #4. Apply a systematic approach to solve problems. #5. Use a variety of thinking skills to anticipate and solve problems.
Course Evaluation:	Passing Grade: 50%, D
Evaluation Process and Grading System:	Evaluation Type / Evaluation Weight table below
Books and Required Resources:	Basic Technical Calculus with Analytic Geometry by A. J. Washington Publisher: Pearson Edition: 10
Course Outcomes and Learning Objectives:	(see below)

Evaluation Type	Evaluation Weight
Tests (4 x 25%)	100%

Course Outcome 1.

Functions:

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Learning Objectives 1.

1. Distinguish a function from other mathematical expressions or equations.
2. Make a graph of some common families of functions.

Course Outcome 2.

Trigonometric Functions:

Learning Objectives 2.

1. Convert decimal degrees to degrees, minutes, seconds, and also to revolutions.
2. Define six trigonometric ratios and calculate ratios and angles involving right triangles.

Course Outcome 3.

Systems of Linear Equations:

Learning Objectives 3.

1. Solve systems of two linear equations graphically.
2. Solve systems of two linear equations by elimination.
3. Solve systems of two linear equations by comparison.
4. Solve systems of two or three linear equations using determinants.
5. Solve word problems involving linear equations with two or three variables.

Course Outcome 4.

Factoring and Fractions:

Learning Objectives 4.

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1. Use factoring methods of common factoring, difference of squares, trinomials and sum and difference of cubes factoring.
2. Add, subtract, multiply and divide algebraic fractions.
3. Solve fractional equations.

Course Outcome 5.

Quadratic Equations:

Learning Objectives 5.

1. Solve quadratic equations using the methods of factoring, the square root method, completing the square and the quadratic formula.
2. Graph quadratic functions by finding the vertex and the x and y intercepts.

Course Outcome 6.

Trigonometric Functions of any Angle:

Learning Objectives 6.

1. Understand and use the CAST rule.
2. Use trigonometry to solve problems involving angles in any quadrant.
3. Explain what a radian is and convert degrees to radians and vice-versa.
4. Solve problems involving angles in radian measure.

Course Outcome 7.

Vectors and Oblique Triangles:

Learning Objectives 7.

1. Add and subtract vectors graphically and identify the component and resultant vectors.
2. Add and subtract vectors algebraically using a vector chart.
3. Solve problems involving right triangles and vectors.

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4. Use the sine and cosine law to solve problems involving oblique triangles.

Course Outcome 8.

Graphs of Trigonometric Functions:

Learning Objectives 8.

1. Determine the amplitude, period and phase shift of a given trig function.
2. Make a sketch of any of the six trig functions studied. Include two periods.

Course Outcome 9.

Exponents and Radicals:

Learning Objectives 9.

1. Study and apply the rules of exponents and simplify algebraic expressions involving exponents.
2. Write exponential expressions in radical form and vice-versa.
3. Perform algebraic operations on radical expressions including the conjugate radical.

Course Outcome 10.

Exponential and Logarithmic Functions:

Learning Objectives 10.

1. Study and apply the properties of logarithms by expanding and simplifying logarithmic expressions.
2. Solve logarithmic and exponential equations.

Course Outcome 11.

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Additional Types of Systems of Equations:

Learning Objectives 11.

1. Recognize equation forms of circles, parabolas, ellipses and hyperbolas.
2. Solve systems of equations of first and second degree.

Course Outcome 12.

Inequalities:

Learning Objectives 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.

Variation:

Learning Objectives 13.

1. Define the terms ratio and proportion.
2. Reduce a ratio to lowest terms.
3. Solve ratio and proportion problems.
4. Write equations indicating direct, joint and inverse variation.
5. Solve word problems involving variation.

Date:	Thursday, August 31, 2017
	Please refer to the course outline addendum on the Learning Management System for further information.