SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE MARIE, ON

COURSE OUTLINE

Course Title; Mathematics

Code No.: Mth 612-4   **Semesten** One

Program: Aviation Technology

Author: The Mathematics Department

Date: August 1998   **Previous Outline Dated**: June 1997

Approved

Oean   Date   ^

Total Credits: 4   **Prerequisite(s)**: None
Substitute(s): Mth 143
Length off Course: 4 hrs./week   **Total Credit Hours**: 64

I. 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.

II. STUDENT PERFORMANCE OBJECTIVES:

The basic objectives are that the student develop an understanding of the methods studied, demonstrate a i^nowledge of the facts presented and show an ability to use these in the solution of problems. To accomplish these objectives, exercises are assigned. Test questions will be of near equal difficulty to questions assigned in the exercises. The level of competency demanded is the level required to obtain an overall passing average on the tests. The material to be covered is listed below.

III. TOPICS TO BE COVERED: **Approximate Time Frame**

1. Basic Algebraic Operations	13 hours
2. Systems of Equations and Graphing	6 hours
3. Factoring and Fractions	8 hours
4. Exponents and Radicals	6 hours
5. Quadratic Equations	6 hours
6. Trigonometry	14 hours
7. Exponential and Logarithmic Functions	8 hours

IV. LEARNING ACTIVITIES:

TOPIC NUMBER	TOPIC DESCRIPTION	REFERENCE CHAPTER ASSIGNMENTS
1.0	BASIC ALGEBRAIC OPERATIONS	Pages 1-48
		Exercises: 1-1 to 1-11 Review Exercises - Page 46
1.1	Numbers and Literal Symbols	
1.2	Fundamental Laws of Algebra and Order of Operations	
1.3	Calculators and Approximate Numbers	
1.4	Exponents	
1.5	Scientific Notation	
1.6	Roots and Radicals	
1.7	Addition and Subtraction of Algebraic Expressions	
1.8	Multiplication of Algebraic Expressions	
1.9	Division of Algebraic Expressions	
1.10	Equations	
1.11	Formulas and Literal Equations	
1.12	Chapter Review	
2.0	SYSTEMS OF EQUATIONS AND GRAPHING	Pages 84-91, 128-144
		Exercises: 3-3, 3-4, 5-1 to 5-4
2.1	Rectangular Coordinates	
2.2	The Graph of a Function	
2.3	Linear Equation	
2.4	Graphs of Linear Equations	
2.5	Solving Systems of Two Linear Equations Graphically	
2.6	Solving Linear Systems Algebraically	
3.0	FACTORING AND FRACTIONS	Pages 164-198
		Exercises: 6-1 to 6-8
3.1	Special Products	
3.2	Factoring: Common Factor and Difference of Squares	
3.3	Factoring Trinomials	
3.4	Sum and Difference of Cubes	
3.5	Equivalent Fractions	

IV. LEARNING ACTIVITIES (Continued):

TOPIC NUMBER	TOPIC DESCRIPTION	REFERENCE CHAPTER ASSIGNMENTS
3.6	Multiplication and Division of Fractions	
3.7	Addition and Subtraction of Fractibns	
3.8	Equations Involving Fractions	
3.9	Chapter Review	Review Exercises - page 195
4.0	EXPONENTS AND RADICALS	Pages 296-317
		Exercises: 11-1 to 11-6
4.1	Integral Exponents	
4.2	Fractional Exponents	
4.3	Simplest Radical Form	
4.4	Addition and Subtraction of Radicals	
4.5	Multiplication and Division of Radicals	
4.6	Chapter Review	Review Exercises - page 316
5.0	QUADRATIC EQUATIONS	Pages 199-217
		Exercises: 7-1 to 7-4
5.1	Quadratic Equations: Solutions by Factoring	
5.2	Completing the Square	
5.3	The Quadratic Formula	
5.4	The Graph of the Quadratic Function	
5.5	Chapter Review	Review Exercises - page 215
6.0	TRIGONOMETRY	Pages 104-127
		Exercises 4-1 to 4-5
		Review Exercises - page 124
6.1	Angles	
6.2	Defining the Trigonometric Functions	
6.3	Values of the Trigonometric Functions	
6.4	The Right Triangle	
6.5	Applications of Right Triangles	Pages 221-231
		Exercises 8-2, 8-3

rv. LEARNING ACTIVITIES (Continued):

TOPIC NUMBER	TOPIC DESCRIPTION	REFERENCE CHAPTER ASSIGNMENTS
6.6	Trigonometric Functions of Any Angle	
6.7	Radians	
6.8	Oblique Triangles, The Law of Sines	Pages 257-268
		Exercises 9-5. 9-6
6.9	The Law of Cosines	
6.10	Fundamental Trigonometric Identities	Pages 504-510
		Exercise 20-1
7.0	EXPONENTIAL AND LOGARITHMIC FUNCTIONS	Pages 349-377
		Exercises 13-1 to 13-6
		Review Exercises - page 375
7.1	The Exponential and Logarithmic Functions	
7.2	Graphs	
7.3	Properties of Logarithms	
7.4	Logarithms to the Base 10	
7.5	Natural Logarithms	
7.6	Exponential and Logarithmic Equations	
7.7	Chapter Review	

V.   REQUIRED RESOURCES / TEXTS / MATERIALS:

1. Text: "Basic Technical Mathematics With Calculus", Sixth Edition. Metric Version, Washington,. Benjamin/Cummings, 1995.

2. Calculator: (Recommended) SHARP Scientific Calculator EL-531G. The use of sorhe kinds of calculatdrs may be restricted during tests.

VI. EVALUATION PROCESS/GRADING S\^TEM:

MAJOR ASSIGNMENTS AND TESTS
While regular tests will normally be scheduled and announced beforehand, there may be an unannounced test on cunrent work at any time. Such tests, at the discretion of the Instructor, may be used for up to 30% of the overall mark.

VI. EVALUATION PROCESS/GRADING SYSTEM (Continued):

At the discretion of the instoictor, there may be a mid-term exam and there may be a final exam, each of which can contribute up to 30% of the overall mark.

The instojctor will provide you with a list of test dates. Tests may be scheduled out of regular class time.

ATTENDANCE

It is your responsibility to attend alt classes during the semester. Research indicates there is a high correlation between attendance and student success.

If you are absent from class, it is your responsibility to find out what work was covered and assigned and to complete this work before the next class. Your absence indicates your acceptance of this responsibility.

Unexcused absence from a **test may result in a mark of zero ("0").** Absence may be excused on compassionate grounds such as verified illness or bereavement. On return from an excused absence, you should ask your instructor to schedule the writing of a make-up test. Failure to do so will be considered as an unexcused absence.

METHOD OF ASSESSMENT (GRADING METHOD)

A+	Consistently outstanding	(90%-100%)
A	Outstanding Achievement	(80% - 89%)
B	Consistently above average achievement	(70% - 79%)
C	Satisfactory or acceptable achievement in all areas subject to assessment	(55% - 69%)
X or R	A temporary grade, limited to situations with extenuating circumstances, giving a student additional time to complete course requirements (Seet>elow)	(45% - 54%)
R	Repeat - The student has not achieved the objectives of the course, and the course must be repeated	(0% - 44%)
CR	Credit exemption	

The method of calculating your weighted average will be defined by your instructor. Since grades are based upon averages, it follows that good marks in some tests can compensate for a failing mark in another test.

VI. EVALUATION PROCESS/GRADING SYSTEM (Continued):

Make-Up Test (if applicable)

An "X" grade may be assigned at the end of the regular semester if you have met ___**ALL**___ of the following criteria:

- an overall average between 45% and 54% was achieved
- at least 50% of the tests were passed
- at least 80% of the scheduled classes were attended
- all of the topic tests were written

If you are assigned an "X" grade, you may convert it to a "C" grade by writing a make-up test on topics agreed to by the instnjctor. This test will be available at the time agreed to by your instructor.

At the end of the regular term, it is your responsibility to obtain your results from your Instructor and, in the *event* of an "X" grade, to inquire when the make-up test vi^ll be available.

The score you receive on this make-up test will replace your original test score and be used to re-calculate your weighted average. If the re-calculated average is 55% or greater, a "C grade will be assigned. If the re-calculated average is 54% or less, an "R" grade will be assigned.

"R" and "X" Grades at the end of the Semester

If an "X" grade is not cleared by the specified date, it will become an "R" grade. Except for extenuating circumstances, an "X" grade in Math will not be carried into the next semester.

"R" Grades during the Semester

A student with a failing grade and poor attendance (less than 80% attendance) may be given an "R" at any time during the semester.

VII. SPECIAL NOTES:

Students with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities), are encouraged to discuss required accommodations with the professor and/or contact the Special Needs Office.

Advanced Standing
Students who have completed an equivalent post-secondary course must bring relevant documents to the Coordinator, Mathematics Department:

- a copy of course outline
- a copy of the transcript verifying successful completion of the equivalent course

Note: A copy of the transcript must be on file in the Registrar's Office.

VIM. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the instructor or the Prior Learning Assessment Office (E2203).