SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: MATHEMATICS

CODE NO.: MTH 612-4   **SEMESTER;**

PROGRAM: AVIATION TECHNOLOGY

AUTHOR: J, McGAULEY

DATE: JULY 199 3   **PREVIOUS OUTLINE DATED**   JULY 1992

APPROVED:

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COURSE NAME   **COURSE NUMBER**

TOTAL CREDIT HOURS: 64

PREREQUISITE(S): None

I, PHILOSOPHY/GOALS:

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 knowledge 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.

Ill- TOPICS TO BE COVERED:

1. Fundamental Concepts and Operations (13 hours)

2. Systems of Equations and Graphing (6 hours)

3. Factoring and Fractions (8 hours)

4. Exponents and Radicals (5 hours)

5. Quadratic Equations (6 hours)

6. Trigonometry (14 hours)

7. Exponential and Logarithmic Functions (8 hours)

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IV. LEARNING ACTIVITIES: **REQUIRED RESOURCES:**

Fundamental Concepts and   Pgs. 1-53
    Operations

1.1 Numbers and Literal   Exercises: 1-1 to 1-12, 1-14
    Symbols

1.2 Fundamental Laws of
    Algebra and Order of
    Operations

1.3 Operations with Zero

1.4 The Calculator

1.5 Exponents

1.6 Scientific Notation

1.7 Roots and Radicals

1.8 Addition and Subtraction
    of Algebraic Expressions

1.9 Multiplication of
    Algebraic Expressions

1.10 Division of Algebraic
    Expressions

1.11 Equations

1.12 Formulas and Literal
    Equations

1.13 Chapter Review   Review Exercises (pg. 50)

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IV. LEARNING ACTIVITIES   **REQUIRED RESOURCES:**

2.0 <u>Systems of Equations and</u>   Pgs. 64-72, 109-126
     <u>Graphing</u>

2.1 Rectangular Coordinates   Exercises 2-3, 2-4
                                                    4-1 to 4-4
2.2 The Graph of a Function

2.3 Linear Equations

2.4 Graphs of Linear
     Equations

2.5 Solving Systems of Two
     Linear Equations
     Graphically

2.6 Solving Linear Systems   <
     Algebraically

3.0 <u>Factoring and Fractions</u>   Pgs. 149-184

3.1 Special Products   Exercises 5-1 to 5-7

3.2 Factoring: Common Factor
     and Difference of Squares

3.3 Factoring Trinomials

3.4 Equivalent Fractions

3.5 Multiplication and
     Division of Fractions

3.6 Addition and Subtraction
     of Fractions

3.7 Equations Involving
     Fractions

3.8 Chapter Review   Review Exercises

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IV.   LEARNING ACTIVITIES   **REQUIRED RESOURCES**

4.0   Exponents and Radicals   Pgs. 288-314

4.1   Integral Exponents   Exercises 10-1 to 10-6

4.2   Fractional Exponents

4.3   Simplest Radical Form

4.4   Addition and Subtraction
      of Radicals

4.5   Multiplication of
      Radicals

4.6   Division of Radicals

4.7   Chapter Review   Review Exercises (pg. 312

5.0   Quadratic Equations   Pgs. 185-204

5.1   Quadratic Equations: Exercises 6-1 to 6-4
      Solution 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 (pg. 203)

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IV.   LEARNING ACTIVITIES: **REQUIRED RESOURCES**

6.0   <u>Trigonometry</u>   Pgs. 84-104

6.1   Angles   Exercises 3-1 to 3-5

6 . 2 Defining the
       Trigonometric Functions

6.3   Values of the
      Trigonometric Functions

6.4   The Right Triangle

6.5   Applications of Right
      Triangles

6.6   Trigonometric Functions   Pg. 208-220
      of Any Angle   Exercises 7-2, 7-3

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6.7   Radians

6.8   Oblique Triangles, The   Pg, 247-258
      Law of Sines   Exercises 8-5, 8-6

6.9   The Law of Cosines

6.10 Fundamental Trigonometric   Pg. 522-530
      Identities   Exercise 19-1

1. 0 <u>Exponential and</u>   Pgs. 349-372
        <u>Logarithmic Functions</u>

7.1   The Exponential and   Exercises 12-1 to 12-6
      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

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V, METHOD OF EVALUATION:

As per the Mathematics Department Evaluation Guidelines distributed
separately.

Periodic tests and daily assignments based on material in the course
outline will be given during the semester. A final exam and a make-up
test will be given at the discretion of the professor.

Grading;

                    A+ = 90-100%
                    A = 80- 89%
                    B = 65- 79%
                    C = 55- 64%
                    R = 0- 54%

A passing grade will be based on a minimum average grade of 55%.
Students obtaining an average grade of 45-55% may be allowed to write a
supplementary examination; for eligibility, please consult the
Mathematics Department Evaluation Guidelines.

VI. REQUIRED STUDENT RESOURCES:

Text:

 "Basic Technical Mathematics with Calculus" Fifth Edition (Metric
Vers ion). Washington. (Benj amin/Cummings)

Calculator:

Recommended: Sharp Scientific Calculator EL-531G

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**VII. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY
       BOOK SECTION:**

1. College Library:

    The library has many comparable textbooks which may give you
    another perspective on a particular topic.

    Under the Library of Congress Catalogue System section: QA

2. The Learning Assistance Center:

    The Learning Assistance Center (L.A.C.) has a <u>PEER TUTORIAL</u> system
    in place for those who feel they need tutoring. The L.A.C. also
    has some Computer based Math tutorial programs available to the
    student.

VIII. SPECIAL NOTES:

Students with special needs (e.g. physical limitations, visual
impairments, hearing impairments, learning disabilities) are encouraged
to discuss required accommodations confidentially with the instructor
or with the <u>SPECIAL NEEDS COUNSELLOR.</u>

Your instructor reserves the right to modify the course as he/she deems
necessary to meet the needs of students.

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