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 1992   **PREVIOUS OUTLINE DATED:** JUNE 1991

APPROVED: DEA^K ^

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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.

III. 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 (6 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:**

<u>Fundamental Concepts and</u>   Pgs. 1-53
    <u>Operations</u>

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 Systems of Equations and   Pgs. 64-72, 109-126
     Graphing

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 Factoring and Fractions   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 <u>Exponents and Radicals</u>   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 <u>Quadratic Equations</u>   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

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

7.0 <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 assigninents 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
Version). Washington. (Benjamin/Cummings)

Calculator:

Recommended: Sharp Scientific Calculator EL-531P

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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 PEER TUTORIAL 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 SPECIAL NEEDS COUNSELLOR.

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