


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: JUNE 1991 PREVIOUS OUTLINE DATED: NEW

APPROVED:


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MATHEMATICS

MTH 612-4

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)

MATHEMATICS

MTH 612-4

COURSE NAME

COURSE NUMBER

IV. LEARNING ACTIVITIES

REQUIRED RESOURCES:

Fundamental Concepts and
Operations

Pgs. 1-53

1.1 Numbers and Literal
Symbols

Exercises: 1-1 to 1-12, 1-14

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)

MATHEMATICS

MTH 612-4

COURSE NAME

COURSE NUMBER

IV LEARNING ACTIVITIES

REQUIRED RESOURCES:

2.0 Systems of Equations and Graphing

Pgs. 64-72, 109-126

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

MATHEMATICS

MTH 612-4

COURSE NAME

COURSE NUMBER

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:
Solution by Factoring

Exercises 6-1 to 6-4

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)

MATHEMATICS

MTH 612-4

COURSE NAME

COURSE NUMBER

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 of Any Angle | Pg. 208-220 Exercises 7-2, 7-3 |
| 6.7 | Radians | |
| 6.8 | Oblique Triangles, The Law of Sines | Pg. 247-258 Exercises 8-5, 8-6 |
| 6.9 | The Law of Cosines | |
| 6.10 | Fundamental Trigonometric Identities | Pg. 522-530 Exercise 19-1 |
| 7.0 | <u>Exponential and Logarithmic Functions</u> | Pgs. 349-372 |
| 7.1 | The Exponential and Logarithmic Functions | Exercises 12-1 to 12-6 |
| 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 | |

MATHEMATICS

MTH 612-4

COURSE NAHE

COURSE NUMBER

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.

The final mark will be based on the results of several unit tests.

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)

MATHEMATICS

MTH612-4

COURSE NAME

COURSE NUMBER

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.