

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

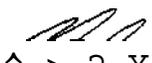
COURSE TITLE: TECHNICAL MATHEMATICS

B MTH119-4 I
CODE NO.: SEMESTER:

PROGRAM: MECHANICAL/ELECTRICAL/ELECTRONICS/COMPUTER TECHNICIAN

B J. REAL
AUTHOR:

DATE: JULY 1992 PREVIOUS OUTLINE DATED: JULY 1991

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TECHNICAL MATHEMATICS

MTH119-4

COURSE NAME

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TOTAL CREDIT HOURS: 64

PREREQUISITE(S): Grade 12 Technical Mathematics

I. PHILOSOPHY/GOALS:

This first level course for technicians/technologists begins with some rules for technical calculations - approximate numbers, significant digits, and includes a review of the metric system. This is followed by several elementary algebra topics - functions and graphs, linear equations, factoring, fractions and quadratic equations. A brief treatment of trigonometry of right triangles is also included.

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:

TIME FRAME:

- | | |
|--|------------|
| 1. Units of Measurement and Approximate Numbers. | 5 periods |
| 2. Fundamental Concepts and Operations. | 10 periods |
| 3. Functions and Graphs. | 8 periods |
| 4. The trigonometric Functions. | 8 periods |
| 5. Systems of Linear Equations. | 8 periods |
| 6. Factoring and Fractions. | 12 periods |
| 7. Quadratic Equations. | 9 periods |

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IV. LEARNING ACTIVITIES:

REQUIRED RESOURCES:

1.0 Units of Measurement and Approximate Numbers

Appendix B

- 1.1 The metric system (SI).
- 1.2 Approximate numbers and significant digits.
- 1.3 Arithmetic operations with approximate numbers.

Questions 1 - 39 , p.A-9
Questions 1 - 39 , p.A-12
Questions 1 - 44 , p.A-16

2.0 Fundamental Concepts and Operations

Chapter 1

- 2.1 Numbers and literal symbols.
- 2.2 Fundamental laws of algebra and order of operations.
- 2.3 Operations with zero.
- 2.4 Exponents.
- 2.5 Scientific notation.
- 2.6 Roots and radicals.
- 2.7 Addition and subtraction of algebraic expressions.
- 2.8 Multiplication of algebraic expressions.
- 2.9 Division of algebraic expressions.
- 2.10 Equations.
- 2.11 Formulas and literal equations.
- 2.12 Review exercise.

Questions 1 - 36, p.5

Questions 1 - 52, p.11
Questions 1 - 60, p.19
Questions 1 - 48, p.23
Questions 1 - 44, p.25
 44, p.31
Questions 1 - 56, p.33
Questions 1 - 40, p.37
Questions 1 - 36, p.40
Questions 1 - 36, p.43
Questions 1 - 104, p.51

3•0 Functions and Graphs

Chapter 2

- 3.1 Introduction to functions.
- 3.2 Rectangular coordinates.
- 3.3 The graph of a function.
- 3.4 Solving equations graphically.
- 3.5 Review exercise.

Questions 1 - 36 p. 58
Questions 1- - 27 p.66
Questions 1 - 3 2 p.71
Questions 1 - 2 8 p.79
Questions 1 - 5 2 p.80

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IV. LEARNING ACTIVITIES: (cont'd)

REQUIRED RESOURCES:

<u>4.0</u> <u>The Trigonometric Functions</u>	Chapter 3
4.1 Angles.	Questions 1 - 44, p- 87
4.2 Defining the trig, functions.	Questions 1 - 32, p-,91
4.3 Values of the trig, functions.	Questions 1 - 40, p-,96
4. The right triangle.	Questions 1 - 36, p-,100
4.5 Applications of right triangles	Questions 1 - 27, p-,103
4.6 Review exercise.	Questions 1 - 76, p-,105
<u>5.0</u> <u>Systems of Linear Equations</u>	Chapter 4.
5.1 Linear equations.	Questions 1 20, p.112
5.2 Graphs of linear equations.	Questions 1 31, p.116
5.3 Solving systems of two linear equations in two unknowns graphically.	Questions 1 30, p.119
5.4 Solving systems of two linear equations in two unknowns algebraically.	Questions 1 - 36, p.125
5.5 Solving systems of two linear equations in two unknowns by determinants.	Questions 1 - 32, p.131
5.6 Solving systems of three linear equations in three unknowns algebraically.	Questions 1 - 14, p.137
5.7 Solving systems of three linear equations in three unknowns by determinants.	Questions 1 - 28, p.143
5.8 Review exercise.	Questions 1 - 74, p.145
<u>6.0</u> <u>Factoring and Fractions</u>	Chapter 5
6.1 Special products.	Questions 1 68, p.152
6.2 Common factor and difference of squares.	Questions 1 60, p.156
6.3 Factoring trinomials.	Questions 1 60, p.162
6.4 Equivalent fractions.	Questions 1 60, p.166
6.5 Multiplication and division of fractions.	Questions 1 40, p.170
6.6 Addition and subtraction of fractions.	Questions 1 - 52, p.176
6.7 Equations involving fractions.	Questions 1 44, p.180
6.8 Review exercise.	Questions 1 104, p.182

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IV. LEARNING ACTIVITIES: (cont'd)

REQUIRED RESOURCES:

7.0 Quadratic Equations

Chapter 6

7.1 Solution by factoring.

Questions 47, 189

7.2 Completing the square.

Questions 24, 193

7.3 The quadratic formula.

Questions 36, 197

7.4 The graph of the quadratic function,

Questions 24, 202

7.5 Review exercise.

Questions 1 - 60, p.202

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V. METHOD OF EVALUATION:

1. Four - five tests per semester.
2. Final grade is a weighted average of these tests.

90 - 100 = A+
80 - 89 = A
65 - 79 = B
55 - 64 = C
0 - 54 = R (or X)

A final B grade (or better) is required to continue in technology level mathematics.

Under special circumstances, an X grade may be assigned to allow the student to continue with the next math, course (Technician level). If unsuccessful with this next course, both courses would have to be repeated. Such a student would have demonstrated good attendance, written all tests, and have a final course average greater than 45%. If successful with the next course, a C grade will be assigned for this course (MTH119). If unsuccessful with the next course, the student will receive an R grade in both.

A credit for this course may be allowed upon presentation of proof of standing in appropriate grade 13 mathematics courses. A score of 70% (or better) in the pre-test must be achieved as well.

All tests are scheduled in advance. Hence, attendance is mandatory. Unexcused absence from a test will result in a mark of zero for that test. If a student is prevented from writing a test by illness, the instructor should be notified before the time of the test. Upon return to class, the student should see the instructor immediately to arrange a time for a make-up test. The student should have a note from the college nurse or a doctor.

VI. REQUIRED STUDENT RESOURCES:

Washington, Basic Technical Mathematics With calculus, Fifth edition, metric version. Benjamin/Cummings Pub. Co. 1990

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.

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