

TECHNIC

AL

MATHEMATICS

MTH142-5

COURSENAME

COURSENUMBER

TOTAL CREDIT HOURS: 64

PREREQUISITE5): NONE

SUBSTITUTE6): MTH119, MTH120, MTH 612

L PHILOSOPHY/GOALS:

This first level mathematics course for engineering technology programs begins with a review of fundamental concepts including arithmetic operations. This is followed by several algebra topics - functions and graphs, linear equations, factoring, fractions and quadratic equations. A brief treatment of trigonometry of right triangles is also included.

The goals of this course are, first to show that mathematics does play a most important role in the development and understanding of the various fields of technology and, secondly to ensure that students acquire the mathematical and critical thinking skills necessary to analyze and solve engineering technology problems.

LEARNING TERMINAL PERFORMANCE OBJECTIVES

After studying each of the following topics, the student should be able to:

Topic 1: Basic Algebraic Operations

- 1 Perform basic arithmetic operations on signed numbers.
- 2 Take powers, roots, and reciprocals of signed numbers and algebraic quantities.
- 3 Convert numbers between decimal and scientific notation,
- 4 Simplify expressions by removing grouping symbols and combining like terms.
- 5 Add, subtract, multiply, and divide algebraic expressions.
- 6 Solve simple linear equations, and solve literal equations for the indicated letter.

Topic 2: Functions and Graphs

- 1 Distinguish between relations and functions.
- 2 Graph points, relations and functions.
- 3 Solve equations graphically.

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IL TERMINAL PERFORMANCE OBJECTIVES (contd)

Topic 3: Trigonometric Functions

- 1 Convert angles between decimal degrees, radians, and degrees, minutes and seconds.
- 2 Find the trigonometric functions of an angle.
- 3 Find the missing sides and angles of a right triangle.
- 4 Solve practical problems involving the right triangle.

Topic 4: Systems of Linear Equations

- 1 Find an approximate graphical solution to a system of two equations.
- 2 Solve a system of two equations and two unknowns by the addition-subtraction methods and by the substitution method.
- 3 Solve a system of two equations and two unknowns or three equations and three unknowns using determinants.

Topic 5: Factoring and Fractions

- 1 Factor expressions by removing common factors.
- 2 Factor binomials that are the difference of the two squares.
- 3 Factor trinomials.
- 4 Reduce algebraic fractions.
- 5 Add, subtract, multiply and divide algebraic fractions.
- 6 Solve fractional equations.

- 1 Solve quadratic equations by factoring, by completing the square, and the quadratic formula.
- 2 Graph quadratic equations.

Topic 7: Exponents and Radicals

- 1 Use the laws of exponents to simplify and combine expressions having integral exponents.
- 2 Simplify radicals by removing perfect powers and by rationalizing the denominator.
- 3 Add, subtract, multiply and divide radicals.

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HL TOPICS TO BE COVERED:

TIMEFRAME:

1.	Basic Algebraic Operations	12 periods
2.	Functions and Graphs.	7 periods
3.	The Trigonometric Functions.	10 periods
4.	Systems of Linear Equations.	6 periods
5.	Factoring and Fractions.	12 periods
6.	Quadratic Equations	6 periods
7.	Exponents and Radicals	11 periods

TECHNICAL MATHEMATICS**MTH142-5****COURSENAME****COURSENUMBER****IV. LEARNING OBJECTIVES:****REQUIRED RESOURCES:**

LQ	Basic Algebraic Operations	Chapter 1
11	Numbers and literal symbols.	Questions 1-36. p.3
L2	Fundamental laws of algebra and order of operations.	Questions 1-52. p.10
L3	Calculators and approximate numbers	Questions 1-60. p.15
L4	Exponents.	Questions 1-56. p.21
L5	Scientific notation.	Questions 1-44. p.23
L6	Roots and radicals.	Questions 1-36. p.26
L7	Addition and subtraction of algebraic expressions.	Questions 1-44. p.30
L8	Multiplication of algebraic expressions.	Questions 1-56. p.32
L9	Division of algebraic expressions.	Questions 1-34. p.35
L10	Equations.	Questions 1-36. p.38
LU	Formulas and literal equations.	Questions 1-36. p.41
L12	Review exercise.	Questions 1-104. p.46
2Q	Functions and Graphs	Chapter 3
2.1	Introduction to functions.	Questions 1-36. p.78
2.2	Rectangular coordinates.	Questions 1-27. p.86
2.3	The graph of a function.	Questions 1-32. p.91
2.4	Solving equations graphically. (optional)	Questions 1-28. p.96
2.5	Review exercise.	Questions 1-52. p.100
IQ	The Trigonometric Functions	Chapter 4
3.1	Angles.	Questions 1-44. p.101
3.2	Defining the trig. functions.	Questions 1-32. p.111
3.3	Values of the trig. functions.	Questions 1-40. p.115
3.4	The right triangle.	Questions 1-28. p.119
3.5	Applications of right triangles.	Questions 1-27. p.122
3.6	Review exercise.	Questions 1-76. p.124

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± 0 .	Systems of Linear Equations	Chapter 5.
4.1	Linear equations.	Questions 1 - 20, p.130
4.2	Graphs of Linear Equations.	Questions 1 - 32. p.D5
4.3	Solving systems of two linear equations in two unknowns graphically.	Questions 1 - 28, p.138
4.4	Solving systems of two linear equations in two unknowns algebraically.	Questions 1 - 32, p.143
4.5	Solving systems of two linear equations in two unknowns by determinants.	Questions 1 - 32, p.149
4.6	Solving systems of three linear equations in three unknowns algebraically.	Questions 1 -14, p.153
4.7	Solving systems of three linear equations in three unknowns by determinants.	Questions 1 - 28. p.159
4.8	Review exercise.	Questions 1-64. p.160
IQ	Factoring and Fractions	Chapter 6
51	Spedal products,	Questions 1 68, p.167
5.2	Common factor and difference of squares.	Questions 1 60. p.171
53	Factoring trinomials.	Questions 1 48. p.176
5.4	Simi and Difference of cubes.	Questions 1 20, p.178
5.5	Equivalent fractions.	Questions 1 60. p.181
5.6	Multiplication and division of fractions.	Questions 1 40, p.184
5.7	Addition and subtraction of fractions.	Questions 1 36, p.189
5.8	Equations involving fractions.	Questions 1 44. p.194
5.9	Review exercise.	Questions 1 104, p.195

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6.0	Quadratic Equations	Chapter 7
6.1	Solution by factoring.	Questions 1 - 47, p203
6.2	Completing the square.	Questions 1 - 24, p206
6.3	The quadratic formula.	Questions 1-36, p210
6.4	The graph of the quadratic function.	Questions 1 - 24, p214
6.5	Review exercise.	Questions 1-60, p215
7.0	Exponents and Radicals	Chapter 11
7.1	Integral exponents.	Questions 1-56, p300
7.2	Fractional exponents.	Questions 1-60, p304
7.3	Simplest radical form.	Questions 1-60, p JOS
7.4	Addition and subtraction of radicals.	Questions 1-30, p310
7.5	Multiplication and division of radicals.	Questions 1-5Z p-314
7.6	Review exercise.	Questions 1-70. p316

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V. METHOD OF EVALUATION:

1. Four - five tests per semester. Test questions will be of near equal difficulty to questions assigned in the exercises.
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 credit for this course may be allowed upon presentation of proof of standing in the appropriate grade 13 mathematics course (MAGOA). 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:

1. Text: Washington, Basic Technical Mathematics with Calculus. Sixth edition, metric version. Benjamin/Cummings Pub. Co. 1995.
2. Calculator: (Recommended) SHARP Scientific calculator EL-531G. The use of some **kinds** of calculators may be restricted during tests.

Vn. 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.