

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE* MARIE, ONTARIO

COURSE OUTLINE

Course Title MATHEMATICS
Code No MTH 220-4
program ELECTRICAL AND ELECTRONIC TECHNICIANS
Semester II (3 HOURS PER WEEK)
Date JUNE, 1985
Author: K, CLARKE

New:

Revision

APPROVED:


Chrairferson

Date LA '^/f

CALENDAR DESCRIPTION

MATHEMATICS

MTH 220-4

COURSE NAME

COURSE NUMBER

PHILOSOPHY/GOALS :

Exponents, radicals, logarithmic relationships, solution of quadratic and radical equations, ratio and proportion, analytical trigonometry, trigonometry of the oblique triangle, radian measure, trigonometric identities and equations.

METHOD OF ASSESSMENT (GRADING METHOD):

The students will be assessed by tests. These tests will include periodic tests based upon blocks of subject matter and may, at the instructor's discretion, include unannounced surprise tests on current work and/or a final test on the whole course. A letter grade will be based upon a student's weighted average of his test results. See also the mathematics department's annual publication "To the Mathematics Student" which is presented to students early in each academic year.

TEXTBOOK(S) :

Calter: Technical Mathematics with Calculus

NOTE;

The electrical course will differ from the parallel mechanical course by inclusion of the topic "Complex Numbers", The two courses are out of step throughout the semester,

ENTRY TO COURSES:

Entry to MTH 220 can be earned by passing one of the first semester math courses, either MTH 413 or MTH 120.

In special circumstances a student who has failed one of these courses and is otherwise a very good student, may be permitted to take MTH 120 and MTH 220 in the same semester. For details see the course outline for the first semester math course taken by the student under consideration (MTH 413 or MTH 120).

ENTRY TO SUBSEQUENT COURSES:

Satisfactory completion of MTH 220 is required for admission to third semester technician math courses.

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NOTES:

The course outline covers the second semester mathematics for technicians the Electronic and Electrical Technician programs.

For demonstrating solutions to Quadratic Equations, the filmstrips No. 1168 and 1169 respectively, when possible, subject-related problems should be used for application.

TOPIC OBJECTIVES:

1. Complex Numbers:

The student will be required to:

- a) Express a complex number in rectangular, polar or trigonometric form.
- b) Convert from any form to any other form.
- c) Perform arithmetic and algebraic operations with complex numbers including multiplication, division, addition, subtraction, use of parentheses, powers and roots.

2. Radicals:

The student will be required to:

- a) Simplify algebraic expressions involving powers and radicals.

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TOPICAL OBJECTIVES - Continued

3 « Quadratic Equations:

The student will be required to:

- a) Recognize and solve quadratic equations by quadratic formula .
- b) Be able to use the discriminant to identify the kind of roots a quadratic equation has without solving the equation•
- c) Be able to solve radical equations including the rejection of extraneous roots.

4. variation;

The student will be required to;

- a) Be able to solve problems using a constant of proportionality.

^* Angles and Oblique Triangles;

The student will be required to;

- a) Be able to find any trigonometric function of any angle.
- b) Be able to find the angles corresponding to any given function va
- c) Be able to use radian angle measure in solving problems,
- d) Be able to solve problems involving oblique triangles by use of t sine and cosine laws .

6. Graphs of Trigonometric Functions:

The student will be required to;

- a) Understand and use the concepts of amplitude, period, frequency a phase angle•
- b) plot curves of trigonometric and inverse trigonometric runctions

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OBJECTIVES:

The basic objective is for the student to develop an understanding of the methods studied, knowledge of the facts presented and an ability to use them in the solution of problems. For this purpose exercises are assigned, and they will reflect the sort of work contained in the assignments. The level of competency demanded is the level required to obtain an overall passing average in the tests. The material to be covered is listed below:

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	ASSIGNMENTS	REFERENCES
1	9	<u>COMPLEX NUMBERS</u> - Complex Numbers - Operations with Complex Numbers in Rectangular Form - Graphing Complex Numbers - Trigonometric and Polar Forms of a Complex Number - Vectors - Alternating-Current Calculations	TEXT, EX 18-1,2,3, 5, 6 (part)	TEXT, 18 omi Sectio
		<u>RADICALS</u> - Simplification of Radicals - Operations with Radicals - Radical Equations	TEXT, EX. 10-1,2,3	TEXT CHAPTE
		<u>QUADRATIC EQUATIONS</u> - Solution by Formula - Fractional and radical equations	TEXT, EX 11-5	TEXT CHAPTI Sectio only
		<u>VARIATION</u> - Direct Variation - The power Function - Inverse Variation - Functions of More than One Variable	TEXT, EX 16-1 to 16-4	TEXT CHAPTI

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11	<u>ANGLES AND OBLIQUE TRIANGLES</u>	TEXT, EX 12-1 TO 12-3, EX 13-1 TO 13-4	TEXT CHAPTE 12 & 1
	- Trigonometric Functions of any Angle		
	- Radian Measure and Arc Length		
	- Uniform Circular Motion		
	- Law of Sines		
	- Law of Cosines		
	- Applications		
	- Addition of Vectors		
8	<u>GRAPHS OF TRIGONOMETRIC FUNCTIONS</u>	TEXT, EX 14-1 TO 14-4	TEXT CHAPTI
	- The Sine Curve		
	- Cosine and Tangent Curves		
	- Polar Co-ordinates		
	- Two Applications of the Sine or Cosine Waves		

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