

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

COURSE OUTLINE

Course Title: MATHEMATICS  
Code No.: MTH 128-4 (FORMERLY MTH 220--4)  
Program: ELECTRICAL AND ELECTRONIC TECHNICIANS  
Semester: II  
Date: JANUARY 1988  
Author: K. CLARKE

New:

Revision

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APPROVED:

  
Chairperson

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Date

## CALENDAR DESCRIPTION

MATHEMATICS

MTH 128-4  
ELECTRICAL & ELECTRONICS  
TECHNICIANS SEM II

COURSE NAME

COURSE NUMBER

PHILOSOPHY/GOALS:

The course begins with number systems and Boolean algebra followed by complex numbers. These topics are needed in certain major subject areas. The course continues with a review of secondary school algebra and trigonometry and extends each of these topics a bit beyond the level of many secondary school programs.

METHOD OF ASSESSMENT (GRADING METHOD);

The student's progress will be assessed by periodic written tests. The student's final grade is based upon a weighted average of the test results. A separate handout will include a schedule of tests, a description of the method used to find the weighted average and a number of requirements and suggestions with regard to tests. ATTENDANCE AT ALL TESTS IS REQUIRED. Unexcused absence from a test will result in a mark of zero for that test. A student may be prevented from attending a test by illness or bereavement. Upon return to classes the student must see the instructor at the end of the first mathematics class attended to arrange a time and place for a make up test. In addition, if the absence is due to illness the student must present a note from the student's doctor or from the College nurse.

Make up tests will not be made available in this course in any other circumstances than those described above-

As in any other subject the student is preparing to be a technologist or technician as well as studying the subject- Hence, on tests the student is expected to produce neat, legible, well laid out solutions which show clearly how the answer was obtained. If anything less is required, this will be indicated in the test. Failure to show such solutions may render correct answers worthless. As happens in the workplace if anything you put on paper can be misread it will be. In addition to loss of marks on individual questions, up to 25% of the marks available on a test can be subtracted as a penalty for untidiness. Marks lost in such penalties can be redeemed by a student willing to put forth the required effort.

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Proper solutions as described above should be produced for all your assigned work. Such practice will make it easier for you to produce the required quality of work on tests. If when you look at a page of your work it makes you feel proud of its appearance, than you are probably on target.

Marks allotted to each question on a test are usually shown. Please enquire if they are not. The questions on a test do not necessarily have equal values.

TEXTBOOK(S):

Washington: BASIC TECHNICAL MATHEMATICS WITH CALCULUS, 4th Ed. - Metric

NOTE:

The electrical course differs from the parallel mechanical course by the inclusion of the topics "Complex Numbers" and "Number Systems and Boolean Algebra". The two courses are out of step throughout the semester.

ENTRY TO COURSES:

Entry to this course can be earned by passing one of the first semester math courses, either technician or technology math of this program-

A student who has good attendance, has written all his tests and who has failed first semester Electrical Technology mathematics with an overall average of 45% or better may be admitted to second semester technician mathematics. If the student fails the semester II course he will have two "R" grades on his transcript and he will have to take and pass a semester I math course in order to regain admission to the semester II math. If he is successful in the semester II technician math, the student will receive his grade in semester I technician mathematics. The "R" grade in semester I technology mathematics will remain on the student's record. This will enable the student to continue with technician mathematics in his second year-

ENTRY TO THE SUBSEQUENT COURSES;

Satisfactory completion of this course is required for admission to the third semester technician math course.

TOPIC OBJECTIVES:

1. Number Systems and Boolean Algebra

The student will be required to:

- Be able to express any number as a binary, octal, hexadecimal or binary coded decimal number.
- Be able to perform arithmetic manipulations with numbers in any of the above forms.
- Be able to subtract using complements.
- Be able to write a Boolean expression corresponding to any logic circuit.
- Be able to draw a logic circuit corresponding to any Boolean expression.
- Be able to generate a truth table for any logic circuit.
- Be able to simplify logic circuits by use of Boolean algebra.

2. 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 brackets, powers and roots.

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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. 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 value
- c) Be able to use radian angle measure in solving problems.
- d) Be able to solve problems involving scalene triangles by use of the sine and cosine laws.

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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 these in the solution of problems. For this purpose exercises are assigned. Tests 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	REF
14		NUMBER SYSTEMS & BOOLEAN ALGEBRA		
		Binaryr octal, hexadecimal Change of base, algebra of elements Addition, multiplication, subtraction & division Definition of elements & operators Truth tables, derivation & use of simple identities Application to logic & switching eircuits	PRINTED SHEETS	
11		<u>COMPLEX NUMBERS</u>	TEXT EX 11-1,2 3,4,6 (pt), 7,8	TEXT, Ch.11 omit- ting sec 11-5
		- Complex Numbers - Operations with Complex Numbers in Rectangular Form - Graphing Complex Numbers - Trigonometric and Polar Forms of Complex Number - Alternating-Current Calculations		

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	QUADRATIC EQUATIONS	TEXT	TEXT
	- Solution by Formula	EX 6--3,	CHAPTER
	- Fractional and radical equations	13-4	6
			sec, 3
			ch,11
			sec. 4
10	ANGLES AND OBLIQUE TRIANGLES	TEXT	TEXT
	- Trigonometric Functions of any Angle	EX 7--1 TO	CHAPTERS
	- Radian Measure and Arc Length	7-5, EX	7-8
		8-5,	
	- Law of Sines	8-6	
	- Law of Cosines		
	- Applications		
	- Addition of Vectors		