SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: TECHNICAL MATHEMATICS

CODE NO,: MTH 221-4   **SEMESTER** II

PROGRAM; ARCHITECTURAL/CIVIL ENGINEERING TECHNICIAN

AUTHOR: J. MCGAULEY

DATE: JULY 1992   **PREVIOUS OUTLINE DATED** JUNE 1991

APPROVED: _EJEAN_   _g^^^_ DATE

TECHNICAL MATHEMATICS   MTH 221-4   *i*

COURSE NAME   **COURSE NUMBER**

TOTAL CREDIT HOURS: 51

PREREQUISITE(S): MTH 120-4

I, PHILOSOPHY/GOALS:

This course consists of Algebra, Trigonometry and Analytic Geometry.
Topics studied included: Simultaneous and Quadratic Equations,
Exponents, Radicals, Ratio, Proportion and Variation.* Also included is
a review of Trigonometry including an analysis of oblique triangles.
The course concludes with a study of Analytic Geometry.

II   STUDENT PERFORMANCE 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 on the tests. The material to be
covered is listed on the following pages.

III. TOPICS TO BE COVERED:

(1) Algebraic and Graphical Solutions
     of Systems of Equations   a hours

(2) Quadratic Equations   6 hours

(3) Exponents and Radicals   8 hours

(4) Ratio, Proportion and Variation   5 hours

(5) Trigonometry   12 hours

(6) Analytic Geometry   12 hours

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COURSE NAME   **COURSE NUMBER**

IV.   LEARNING ACTIVITIES   **REQUIRED RESOURCES**

TOPIC   NUMBER   TOPIC DESCRIPTION   REQUIRED RESOURCES
NUMBER OF PERIODS   (REFERENCES)

	SYSTEMS OF LINEAR EQUATIONS
	- Linear equations
	- Graphs of linear equations
	- Graphical solutions - two
	  unknowns
	- Algebra solutions - two
	  unknowns
	  - addition/subtraction method
	  - substitution method
	  - comparison method
	- Three equations - three
	  unknowns
	- Review exercises
		CHAPTER p. 109 148
		Ex. 4.1 odds
		Ex. 4.2 odds
		Ex. 4.3 odds
		
		Ex. 4.4
		Ex. 4.4
		Instructor Handout or
		Ex. 4.4
		Ex. 4.6 - 3,9,19,20
		Ex. 4.8 (21,31,55,73)
		Instructor's Option

2.	QUADRATIC EQUATIONS
	- Solution by factoring
	- Completing the square
	  (emphasize)
	- Quadratic formula
	- Graph of the quadratic
	  function
	- Review exercises
		CHAPTER 6, P.185-204
		Ex. 6.1 Odds
		Ex. 6.2 Odds
		
		Ex. 6.3 Odds
		Ex. 6.4 Odds
		
		Ex. 6.5 Instructor's
		Opt:ion

3.	EXPONENTS AND RADICALS - Integral exponents - Fractional exponents - Simplest radical form - Add/subtract radicals - Multiply radicals - Divide radicals - Review exercises	CHAPTER 10 p.288-314 Ex. 10.1 Odds 1-51 Ex. 10.2 Odds 1-51 Ex. ^0.3 Odds 1-63 Ex. 10.4 Odds 1-31 Ex. 10.5 Odds 1-43 Ex. 10.6 Odds 1-51 Ex. 10.7 Instructor' Option

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IV. LEARNING ACTIVITIES   **REQUIRED RESOURCES**

TOPIC NUMBER   TOPIC DESCRIPTION   REQUIRED RESOURCES
NUMBER OF PERIODS   (REFERENCES)

		RATIO, PROPORTION & VARIATION - Ratio and proportion - Variation - Review exercises	CHAPTER 17 p. 486-500 Ex. 17.1 Odds 1-35 Ex. 17.2 Odds 1-41 Ex. 17.3 Instructor's Option
	12	TRIGONOMETRY - Signs of trig, functions - trig. functions any size angle - radians - radian applications - Chapter 7 review - Oblique triangles - sine law - Oblique triangles cosine law - Chapter 8 review	CHAPTERS 7&8 p.205-260 Ex odds Ex odds 1-43 Ex 1-53 Ex Inst. Option Ex Inst. Option Ex 1,3,5,15,17,19,23,27, 29 Ex. 8.6 1,3,5,9,23,25 Ex, 8.7 Inst. Option

6.	12	PLANE ANALYTIC GEOMETRY
		
		- Basic definitions
		- The straight line -
		  properties, equations, graphs
		- The circle - properties,
		  equations, graphs
		- The parabola - properties,
		  equations, graphs
		- Review exercises
			CHAPTER 2 0
			p.558-601,608-612
			Ex. 20.1 Odds 1-39
			Ex. 20.2 Odds 1-39
			
			Ex. 20.3 & 20.7
			
			Ex. 20.4 & 20.7
			
			Ex. 20.11
			Instructor's Option

NOTE: Additional analytic geometry problems, including the ellipse
       and/or hyperbola may be provided in a handout.

V,   METHOD OF EVALUATION:

The final grade will be derived from the average of the results from the periodic tests given.

The grading system used will be as follows:

$$
\begin{array}{lll}
A+ & = & 90 - 100\% \\
A & = & 80 - 89\% \\
B & = & 65 - 79\% \\
C & = & 55 - 64\% \\
R & = & 0 - 54\% \\
\end{array}
$$

A passing grade will be based on a minimum grading of 55%.

VI.   REQUIRED STUDENT RESOURCES:

TEXTBOOK: "BASIC TECHNICAL MATHEMATICS WITH CALCULUS", Fifth (Metric) edition, Washington.

Electronic calculator which includes trigonometric functions

SUGGESTION: SHARP EL-9000 Super Scientific Calculator or equivalent

VII. 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.