

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

COURSE QUOTE

COURSE TITLE: TECHNICAL MATHEMATICS
CODE NO.: MTH 220-4 SEMESTER: II 4 HRS/WK
PROGRAMS: WATER RESOURCES/PULP & PAPER/ENVIRONMENTAL ENG.
AUTHOR: W. MACQUARRIE
m JULY 1994 PREVIOUS OUTLINE DATED: JULY 1993
WATE:

APPROVED; DEAM DATE

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

TECHNICAL MATHEMATICS

MTH 220-4

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COURSE NUMBER

TOTAL CREDIT HOURS: 68

PREREQUISITE(S): MTH 120-4

SUBSTITUTE(S): MTH 143

L PHILOSOPHY/GOALS:

This course consists of Algebra, Trigonometry and Analytic Geometry. Topics studied included: Simultaneous and Quadratic Equations, Exponents, Radicals, Exponential and Logarithmic Functions, 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.

The course prepares the student for the study of Calculus in the subsequent mathematics course **MTH 208**.

!!. 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.

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!!!. TOPICS TO BE COVERED:

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|------|---|----------|
| (1) | Algebraic and Graphical Solutions of Systems of Equations | 8 hours |
| (2) | Quadratic Equations | 6 hours |
| (3) | Exponents and Radicals | 3 hours |
| i.-] | E.-wcnertial and Logarithmic runczions | 12 hours |
| (5) | Ratio, Proportion and Variation | 5 hours |
| (6) | Trigonometry | 10 hours |
| (7) | Anaivtic Geometry | 16 hours |

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COURSE NUMBER

IV. LEARNING ACTIVITIES:**REQUIRED RESOURCES:**

TOPIC NUMBER TOPIC DESCRIPTION
 NUMBER OF PERIODS

REQUIRED RESOURCES
 (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 thres unknowns
 Review exercises

CHAPTER 4 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

QUADRATIC EQUATIONS

- Solution by factoring
- Completing the square (empiasize)
- Quadratic formula
- Graph of the quadratic function
- Review exercises

Ex. 4.8 (21,31,65,73)

Instructor's Option

CHAPTER 6, P.185-204

Ex. 6.1 Odds

Ex. 6.2 Odds

Ex. 6.3 Odds

Ex. 6.4 Odds

EXPONENTS AND RADICALS

- Integral exponents
- Fractional exponents
- Simplest radical form
- Add/subtract radicals
- Multiply radicals
- Divide radicals
- Review exercises

Ex. 6.5 Instructor's Option

CHAPTER 10 p.288-314

Ex. 10.1 Odds 1-51

Ex. 10.2 Odds 1-51

Ex. 10.3 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's Option

IV. LEARNING ACTIVITIES:

REQUIRED RESOURCES:

TOPIC NUMBER NUMBER	TOPIC DESCRIPTION OF PERIODS	REQUIRED RESOURCES (REFERENCES)
12	<p>EXPONENTIAL & LOGARITHMIC FUNCTIONS</p> <ul style="list-style-type: none"> - Exponential/ o functions - Graphs $y = b^x$ & $y = \log_b x$ - Logarithm properties - Base 10 logarithms - Natural logarithms - Exponential and logarithmic equations - Graphs on log and semilog paper - Review exercises 	<p>CHAPTER 12 p.349-380</p> <p>Ex.12.1 Odds 1-41 Ex. 12.2 1,3,7,13,19 Ex. 12.3 Odds 1-51 Ex. 12.3 Odds 1-35 Ex. 12.5 Odds 1-37</p> <p>Ex. 12.6 Odds 1-45 Ex. 12.7 Odds 1-23</p> <p>Ex. 12.8 p.1-77 Instructor's Option</p>
	<p>RATIO, PROPORTION &, VARIATION</p> <ul style="list-style-type: none"> - Ratio and proportion - Variation - Review exercise; 	<p>CHAPTER 17 p. 486-500</p> <p>Ex. 17.1 Odds 1-35 Ex. 17.2 Odds 1-41 Ex. 17.3 Instructor's Option</p>
10	<p>TRIGONOMETRY</p> <ul style="list-style-type: none"> - Signs of trig, functions - Trig, functions any size angle - Radians/grads (gons) - Radian applications - Chapter 7 review - Oblique triangles - sine law - Oblique triangles - cosine law - Chapter 8 review 	<p>CHAPTERS 7&8 p.205-260</p> <p>Ex. 7.1 odds Ex. 7.2 odds 1-43 Ex. 7.3 ic handout 1-53 Ex, 7.4 Inst. Option Ex. 7.5 Inst. Option Ex. 8.5 1,3,5,15,17,19,23,27,29 ZX 3.0 1,3,5,9,23,25 Ex. 8.7 Inst. Option</p>

iv. LEARNING ACTIVITIES:

REQUIRED RESOURCES:

TOPIC NUMBER NUMBER OF PERIODS	TOPIC DESCRIPTION	REQUIRED RESOURCES (REFERENCES)
16	PLANE ANALYTIC GEOMETRY	CHAPTER 20
	- Basic definitions	p.558-601,608-612
	- The straight line - properties, equations, graphs	Ex. 20.1 Odds 1-39
	- The circle - properties, equations, graphs	Ex. 20.2 Odds 1-39
	- The parabola - properties, equations, graphs	Ex. 20.3 & 20.7
	- Translation of axes	Ex. 20.4 & 20.7
	- The general second <i>degree</i> equations	Done above (20.7)
	- Review exercises	Ex. 20.8 1-27
		Ex. 20.11 Instructor's Option

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

TECHNICAL MATHEMATICS

MTH 220-4

COURSE NAME

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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:

A+	=	90 - 100%
A	=	80 - 89%
B	=	65 - 79%
C	=	55 - 64%
R	=	0 - 54%

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

A credit for this course may be allowed upon presentation of proof of standing in any OA level math course.

VI. REQUIRED STUDENT RESOURCES:

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

2. Calculator: (Recommended) SHARP Scientific Calculator EL-531G. The use of some kinds of calculators may be restricted during tests.

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.