DOC.#**97**

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE- MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: TECHNICAL MATHEMATICS

CODE NO.: MTH 220-4 **SEMESTER:** II

PROGRAM: WATER RESOURCES/PULP & PAPER/ENVIRONMENTAL ENG.

THOR: W, MACQUARRIE/B. LINDSEY

DATE JAN. 1992 **PREVIOUS OUTLINE DATED** JUNE 1989

APPROVED <0>^ ^ gJBAN< SCHOOL OF SCIENCES & NATURAL RESOURCES

J^7> '(^^^^ DiVTE

INSTRUCTORS (PROFESSORS) RESERVE THE RIGHT TO MAKE CHANGES in rruiF OUTLINES WHERE NECESSARY.

TECHNICAL MATHEMATICS MTH 220-4

COURSE NAME **COURSE NUMBER**

TOTAL CREDIT HOURS: 64

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, Exponential and Logarithmic Functions, Ratio, Proportion and Variation. Also included is a review of Trigonometry including analysis of right triangles and 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.

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	7 hours
(2)	Quadratic Equations	6 hours
(3)	Exponents and Radicals	8 hour^
(4)	Exponential and Logarithmic Functions	*12* hours
(5)	Ratio, Proportion and variation	'houi;•
(6)	Trigonometry	16 hours
(7)	Analytic Geometry	10 hours

t CHNICAL MATHEMATICS — MTH 220-4

COURSE NAME — **COURSE NUMBER**

IV. LEARNING ACTIVITIES — **REQUIRED RESOURCES**

1.0	ALGEBRAIC AND GRAPHICAL SOLUTIONS OF SYSTEMS OF EQUATIONS	EXERCISES:	
1.1	Solving systems of equations by addition or subtractions	16-1	(pg. 289-290)
1.2	Solving systems of equations by substitution	16-2	(pg, 291-292)
1.3	Solving systems of equations by comparison	16-3	(p. 293)
1.4	Solving systems of equations in three or more unknowns	16-5	(pg. 299-300)
t 5	Graphing a linear equation	17-2	(pg. 322)
6	Solving systems of equations graphically	17-3	(pg, 326)
1.7	The slope and equation of a straight line	17-4	(pg.330)

.

TECHNICAL MATHEMATICS — MTH 220-4

COURSE NAME — **COURSE NUMBER**

IV. LEARNING ACTIVITIES	**REQUIRED RESOURCES**	
2.0 QUADRATIC EQUATIONS	EXERCISES:	
2.1 Solving a quadratic equation by factoring	20-2	(pg. 385)
2.2 Solving a quadratic equation by completing a square	20-3	pg. 388)
2.3 Solving a quadratic equation by use of the quadratic formula	20-4	(pg. 392
3.0 EXPONENTS AND RADICALS		
3.1 Multiplication and Division Power of a power Power of a product Power of a fraction	18-1	(pg. 338-339)
3.2 Zero exponent Negative exponent	18-2	(pg. 343-344)
3.3 Roots of numbers Fractional exponents	18-3	(pg, 348-349)
3.4 Roots and radicals	19-1	(pg. 359)
3.5 Simplifying radicals	19-2	(pg. 364-365)
3.6 Addition and subtraction of radicals	19-3	
3.7 Multiplication of radicals	19-4	(pa. 3^l '
3.8 Division of radicals	**19-5**	
3.9 Radical equations	**20-6**	pg. 400)

t ECHNICAL MATHEMATICS — MTH 220-4

COURSE NAME — **COURSE NUMBER**

IV, LEARNING ACTIVITIES		**REQUIRED RESOURCES**
4.0 EXPONENTIAL AND LOGARITHMIC FUNCTIONS	EXERCISES	
4.1 Exponential and logarithmic form and graphs	34-1	(pg. 589)
4.2 Common logarithms Base 10	34-2	(pg. 591-592)
4.3 Logarithms and antilogarithms using the calculator	34-5	(p. 599)
4.4 Expanded log form	35-3	(p. 613)
4.5 Powers using logs	35-4	(p. 616)
t Roots using logs	35-5	(pg. 622-623)
t Logarithm practice	36-2	(p. 633)
4.8 Logarithmic and exponential equations	36-3	(p. 636)
4.9 Natural logs and antilogarithms	36-4	(p. 640-641)
5.0 RATIO, PROPORTION AND VARIATION		
5.1 Write the ratio of numbers or quantities in simplest form	25-1	(pg. **477)**
5.2 Solve a proportion for an unknown terra	25-2	(pq. O'W
5.3 Direct, Joint and Inverse Variation	2S-4 25-5	(pq _ .j;>o_4c_;o , (pg. 491-493)

•

TECHNICAL MATHEMATICS — **COURSE NAME**

MTH 220-4 — **COURSE NUMBER**

IV. LEARNING ACTIVITIES — **REQUIRED RESOURCES**

6.0	TRIGONOMETRY	EXERCISES:	
6.1	Standard position of an angle	37-1	(pg. 648-649)
6.2	Trigonometric ratios or functions	37-2	(pg. 651)
6.3	Find trigonometric and inverse functions using calculators	38-1 38-2	(pg. 656-657) (pg. 659)
6.4	Find the function values in any right triangle	39-1	(pg. 665)
6*5	Solve right triangles	39-2	(pg. 668)
6.6	Solve word problems by using trigonometry	39-4	(pg. 674-675)
6.7	Find the functions of angles of any size	40-1	(pg. 685)
6.8	Find an angle from a given function value	40-2	(pg. 687)
6.9	Find the values of all the functions of an angle, given one function value	40-3	(pg. 688-689)
6.10	The Sine Law	45-1	(pg. 748-749)
6.11	The Cosine Law	45-2	
6.12	Radian measurement	42-1	
6.13	Relating radian and degree measure	42-2	

• ECHNICAL MATHEMATICS — MTH 220-4

COURSE NAME — **COURSE NUMBER**

IV- LEARNING ACTIVITIES: — **REQUIRED RESOURCES:**

7.0	ANALYTIC GEOMETRY	EXERCISES:	
7.1	Sketching circles	23-1	(pg- 451)
7.2	Sketching parabolas	23-2	(pg. 454)
7.3	Sketching the ellipse	23-3	(pg- 455)
7.4	Sketching the hyperbola	23-4	(pg- 457)
7.5	Graphical solution of systems of second degree equations	23-5	(pg. 460)
7.6	Algebraic solution of second degree equations	23-6	(pg. 463)

[redacted]OTE ADDITIONAL ANALYTIC GEOMETRY PROBLEMS FROM ANALYTIC GEOMETRY MANUSCRIPT WILL BE PROVIDED.

TECHNICAL MATHEMATICS | MTH 220-4

COURSE NAME | **COURSE NUMBER**

V. METHOD OF EVALUATION:

The final grade will be derived from the weighted 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%.

VI. REQUIRED STUDENT RESOURCES:

TEXTBOOK: "Essentials of Mathematics"; Fifth Edition-Person ^P

Electronic calculator which includes trigonometric functions

SUGGESTION: SHARP EL-9000 Super Scientific Calculator or etgui-valent

VII. SPECIAL NOTES:

Students with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities) .are encouraged to discuss required accommodations confideriti^lly with the instructor.

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