SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE MARIE, ON

COURSE OUTLINE

Course Title: Technical Mathematics

Code No.:   MTH220   Semester: 2

Program: Environmental/ Water Resources/Pulp & Paper Eng,

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Date: June, 1997   Previous Outline Date: 06/06

Approved: *Qt^^U-^ ^h/p<^^^*   *(1 ^   9^*
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Total Credits: 4   Prerequisite(s): MTH 120
Length of Course: 4Hrs/Wk   Total Credit Hours: 64

L   PHILOSOPHY/GOALS:

This course consists of Algebra, Trigonometry and Analytic Geometry. Topics studied include:
Simultaneous and Quadratic Equations, Exponents, Radicals, Expon^tial and Logarithmic
Functions, Ratio, Prc^rtion and Variatiai. Also included is a review of Trigonometry including
an analysis of oblique triangles. TTiis course concludes with a study of Analytic Geometry.

The course prepares the student for the study of Calculus in the subsequent mathematics course,
MTH208.

IL   STUDENT PERFORMANCE OBJECTIVES:

The basic objective is for the student to develc^ an understanding of the m^ods studied,
knowledge of the facts presented and an ability to use these in the solution of problems. For this
purpose, exercises are assigned. Tests wiU reflect the sort of work ccxxtained in the assignments.
The level of conqjetency demanded is the level required to obtain an overall passing average on the
tests. The material to be covered is listed <m the following pages.

IIL   TOPICS TO BE COVERED: Approximate
                                                                Time Frame

1. Algebraic   and   Graphical   Soluticms   of   Systems   of   Equaticms   S hours

2. Quadratic Equations   6 hours

3. E?q3onents and Radicals   8 hours

4. E?q)c»iential and Logarithmic Functions   12 hours

5. Ratio, Proportion and Variation   5 hours

6. Trigonometry   10 hours

7. Analytic Geometry   16 hours

IV, LEARNING ACTIVITIES:

TOPIC NUMBER	NO. OF PERIODS	TOPIC DESCRIPTION	REFERENCE CHAPTER ASSIGNMENTS
1		**SYSTEMS OF LINEAR EQUATIONS**	Chapter 5 p. 128-163
		- Linear equations	Ex. 5.1 -odds
		- Graphs of linear equations	Ex. 5.2 -odds
		- Graphical soluticxis - two unknowns	Ex. 5.3 -odds
		- Algebra solutions - two unknowns	Ex. 5.4-odds 1-30
		- addition/subtraction method	Ex. 5.6-3,9,19,20
		- substituticHi method	
		- conq)ans(»i method	Ex. 5.8-21,31,65,73
		- TTiree equaticms - three unkiowns	
		- Review exercises	Instructor's Optiai
2.		**QUADRATIC EQUATIONS**	Chapter 7, p. 199-217
		- Solution by fectoring	Ex. 7.1 odds
		- Completing the square (en^hasize)	Ex. 7.2 odds
		- Quadratic formula	
		- Graph of the quadratic functi<Hi	Ex. 7.3 odds
		- Review exercises	Ex. 7.4 odds & review
			Ex. p. 215
3		**EXPONENTS AND RADICALS**	Chapter 11 p. 296-317
		- Integral exponents	Ex. 11.1 odds 1-51
		- Fractional expon^rts	Ex. 11.2 odds 1-49
		- Sinq)lest radical form	Ex. 11.3 odds 1-63
		- Add/subtract radicals	Ex. 11.4 odds 1-31
		- Multiply radicals	Ex. 11.5 odds 1-57
		- Divide radicals	Review Ex. 11.6
		- Review exercises	Instructor's *Option*
4		**EXPONENTUL & LOGARITHMIC FUNCTIONS**	Chapter 13 p. 349-377
		- E?qKxiential/log fimcti<His	Ex. 13.1 odds 1-55
		- Graphs $y = b''$ & y-logbX	Ex. 13.2 1,3,7,13,15
		- Logarithm properties	Ex. 13.3 odds 1-51
		- Base 10 l(^arithms	Ex. 13.4 odds 1-27
		- Natural logarithms	Ex. 13.5 odds 1-35-45
		- E?qx»ie9itial and logarithmic equati<ms	Ex. 13.6 odds 1-45
		- Graphs cm 1<^ and semilog paper	Ex. 13.7 odds 1-23
		-Review	Ex. 1-77 Instructor's OptiiHi

IV.   LEARNING ACTIVITIES (Continued):

TOPIC Pa'MBER	NO. OF PERIODS	TOPIC DESCRIPTION	REFERENCE CHAPTER ASSIGNMENTS
		RATIO, PROPORTION & **VARIATION**	Chapter 18 p. 469-482
		- Ratio and prc^rticai	Ex. 18.1 odds 1-39
		- Variation	Ex. 18.2 odds 1-41
		- Review exercises	Review Ex.
			Intstructor's Option
		TRIGONOMETRY	Chapters 8&9 p.205-260
		- Signs of trig, functions	Ex. 8.1 odds
		- Trig, functions any *size* angle	Ex. 8.2 odds 1-43
		- Radians/grads (gons)	Ex. 8.3 handout 1-53
			Ex. 8.4 Inst. Option
			Ex. 8.5 Inst. Opti<Hi
		- Radian applications	Ex. 9.5
		- Chapter 7 review	1,3,5,15,17,19,23.27,29
		- Oblique triangles - sine law	Ex. 9.6 1,3,5,9,23,25
			Ex. 9.7 Inst. Optiai
		- ObUque triangles - cosine law	
		- Chapter 9 review	
		PLANE ANALYTIC GEOMETRY	Chapter 21 p.536-560, 567-569
		- Basic definiticms	Ex. 21.1 odds 1-39
		- The straigiit line - prq)erties, equations, graphs	Ex. 21.2 odds 1-39
		- The circle - prqwities, equaticxis, graphs	EX.2I.3&21.7
		- The parabola - prq)erties, equations, graphs	Ex. 21.4 & 21.7
		- Translaticxi of axes	
		- The general second degree equaticms	DcHie above (21.7)
		- Review exercises	Ex. 21.8 1-27
			Ex. 21.11 Instructor's OpticHi

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

V.   REQUIRED RESOURCES / TEXTS / MATERIALS:

!.   Textbook: "Basic Technical Mathematics with Calculus", Sixth (Metric) edition, Washington.

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

VI.   EVALUATION PROCESS/GRADING SYSTEM:

MAJOR ASSIGNMENTS AND TESTS

While regular tests will noimally be scheduled and announced beforehand, there may be an unannounced test on current work at any time. Such tests, at the discretion of the instructor, may be used for up to 30% of the overall mark.

At the discretion of the instructor, there may be a mid-term exam and there may be a final exam, each of which can contribute up to 30% of the overall mark.

The instructor will provide you with a list of test dates. Tests may be scheduled out of regular class time.

ATTENDANCE

It is your responsibility to attend all classes during the semester. Research indicates there is a high correlation between attendance and student success.

If you are absent from class, it is your responsibility to find out fi*om your instructor what work was covered and assigned and to con^lete this work before the next class. Your absence indicates your acceptance of this responsibility.

Unexcused absence from a test may result in a mark of zero (^0).** Absence may be excused on compassionate grounds such as verified ilhiess or bereavement. On return from an excused absence, you should ask your instructor to schedule the writing of a make-up test. Failure to do so will be considered as an unexcused absence.

METHOD OF ASSESSMENT (GRADING METHOD)

A+	Consistently outstanding	(90% -100%)
A	Outstanding Achievement	(80% - 89%)
B	Consistently above average achievement	(70% - 79%)
C	Satisfectory or acceptable achievement in all areas subject to assessment	(55% - 69%)
X or R	A temporary grade, hmited to situations with extenuating circumstances, giving a student additional time to complete course requirements **(See below)**	(45% - 54%)

METHOD OF ASSESSMENT (GRADING METHOD)

> **R** Repeat - The student has not achieved   (0% - 44%)
> the objectives of the course, and the
> course must be repeated
>
> CR Credit exemption

The method of calculating your weighted average will be defined by your instructor. Since grades are based upon averages, it follows that good marks in some tests can compensate for a failing mark in another test.

Make-Up Test (if applicable)

An "X" grade may be assigned at the end of the regular semester if you have *met <u>ALL</u>* of the following criteria:

- an overall average between 45% and 54% was achieved
- at least 50% of the tests were passed
- at least 80% of the scheduled classes were attended
- all of the topic tests were written

If you are assigned an "X" grade, you may convert it to a "C* grade by writing a make-up test on topics agreed to by the instructor. This test will be available at the time agreed to by your instructor.

At the end of the regular term, it is yoiu* responsibility to obtain your results from your instructor and, in the event of an "X" grade, to inquire when the make-up test will be available.

The score you receive on this make-up test will replace your original test score and be used to re-calculate your weighted average. If the re-calculated average is 55% or greater, a "C" grade will be assigned. If the re-calculated average is 54% or less, an "R" grade will be assigned.

"R" and "X" Grades at the end of the Semester

If an "X" grade is not cleared by the specified date, it will become an "R" grade. Except for extenuating circumstances, an "X" grade in Math will not be carried into the next semester.

"R" Grades during the Semester

A student with a foiling grade and poor attendance (less than 80% attendance) may be given an "R" at any time during the semester.

VII.   SPECIAL NOTES:

Students with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities), are encouraged to discuss required accommodations vrith the professor and/or contact the Special Needs Office.

VII. SPECIAL NOTES:

Advanced Standing

Students who have completed an equivalent post-secondary course must bring relevant documents to the Coordinator, Mathematics Department:

- a copy of course outline
- a copy of the transcript verifying successful completion of the equivalent course

Note: A copy of the transcript must be on file in the Registrar's Office.

VIIL PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the instructor or the Prior Learning Assessment Office (H0240).