SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: MATHEMATICS

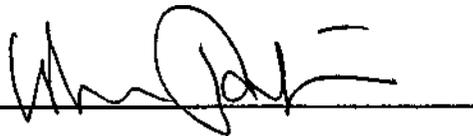**CODE NO.:** MTH 122-4   **SEMESTER:** III

PROGRAM: COMPUTER PROGRAMMER

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DATE: AUGUST 1993   **PREVIOUS OUTLINE DATED:** **AUGUST** 1992

APPROVED: _____   Sx^_-S\^3>.
         DEAN   DATE

MATHEMATICS   **MTH 122-4**

COURSE NAME   **COURSE NUMBER**

TOTAL CREDIT HOURS: 48

PREREQUISITE(S): MTH 111

I. PHILOSOPHY/GOALS:

This course presents the mathematics needed in computer programming. Concepts taught will also assist in other computer courses. Emphasis is placed on how to interpret a problem and to develop a solution algorithm. The computer will be used to obtain output for specified problems.

The goals of this course are, first to show that mathematics does play a most important role in the development and understanding of the various fields of business and, secondly to ensure that students acquire the mathematical and critical thinking skills necessary to analyze and solve business problems.

II. TERMINAL PERFORMANCE OBJECTIVES:

After studying the indicated topics, the student should be able to perform the following objectives:

Topic 1

1. Apply the listing format to represent the elements of a set.
2. Test a set of numbers for closure.
3. Convert decimal numbers to other number bases.
4. Convert any base number to a decimal number.
5. Fundamental arithmetic operations on different bases.
6. Translate characters to ASCII code.

Topic 2

1. Evaluate mathematical expressions.
2. Write algebraic equations using computer symbols.
3. Express numbers in integer, real and exponential format.
4. Determine the result field when adding, subtracting or multiplying numbers.
5. Use an algorithm to round off numbers.
6. Write in computer form, exponential equation.
7. Simplify exponential expressions using laws of exponents.

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II.   TERMINAL PERFORMANCE OBJECTIVES: (cont'd)

Topic 3

1. Use counters to control iterations (FOR-NEXT).
2. Develop algorithms to verify input or output.
3. Application of a sorting program.
4. Create an amortization schedule.
5. Compute elapsed time (aging).

Topic 4

1. Utilize set terminology and operations.
2. Determine the nature and number of elements within sets using Venn Diagrams.
3. Utilize the basic connectives in logic, and the rules that govern each connective.
4. Construct and interpret truth tables.
5. Utilize the notation and properties of Boolean algebra.
6. Simplify Boolean expressions.
7. Draw circuit diagrams.

Topic 5

1. Add, subtract and multiply matrices.
2. Calculate the determinant for any matrix.
3. Calculate the inverse of a matrix.
4. Solve systems of linear equations.
5. Apply the notations and concepts needed to program computers to perform matrix algebra.

III.   TOPICS TO BE COVERED: TIME FRAME (hours)

1.	Number Base Concepts	10
2.	Format Arithmetic	8
3.	Algorithms	8
4.(a)	Sets & Venn Diagrams	14
(b)	Mathematical Logic	
(c)	Basic Boolean Properties	
5.	Matrix Algebra	

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

TIME	UNIT	TOPIC	EXERCISES
10		Number Base Concepts	pg. 1-69
		- Introduction to number systems - Binary, Octal, Hexadecimal systems - Arithmetic operations with different bases - Base Conversions - Codes & Data representation	
		Format Arithmetic	pg. 70-129
		- Evaluation of mathematical expressions - Formats for arithmetic - Arithmetic operation result fields - Exponent calculations	
		Algorithms	pg. 146-174
		- Counters and verification - Sorting - Creating tables	
14		Sets, Logic and Boolean Algebra	pg. 175-230
		- Sets and Venn diagrams - Mathematical logic - Basic Boolean properties	
		Matrix Algebra	pg. 301-334
		- Matrix operations - Determinant calculation - Multiplicative inverse - Solving systems of linear equations	

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V. EVALUATION METHODS: (INCLUDES ASSIGNMENTS, ATTENDANCE REQUIREMENTS ETC.)

The final mark will be based on four unit tests, each representing 25% of the final mark. Test questions will be of near equal difficulty to questions assigned in the exercises.

GRADING:

            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%. Students obtaining a grade of 45-54% may be allowed to write a rewrite test. However, only students who have attended at least 80% of the math classes will be considered for a rewrite test.

VI. REQUIRED STUDENT RESOURCES:

Mathematics for Programming Computers - 3rd Edition. Frank J. Clark. Prentice Hall.

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.