

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

COURSE OUTLINE

COURSE TITLE: MATHEMATICS

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

PROGRAM: COMPUTER PROGRAMMER

% AUTHOR: R. HAMEL

DATE: JULY 1996 **PREVIOUS OUTLINE DATED:** AUGUST 1995 _____

APPROVED:

DEAN

DATE

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TOTAL CREDIT HOURS: 48

PREREQUISITE: MTH 111

SUBSTITUTE: NONE

I. PHILOSOPHY/GOALS:

This course presents mathematics needed in computer studies. Emphasis is placed on developing logical thinking skills and an algorithmic approach to problem-solving.

II. TERMINAL PERFORMANCE OBJECTIVES:

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

Topic 1 - Basic Algebra Review

1. Number sets.
2. Properties of integers and real numbers.
3. Exponents and radicals.
4. Order of operations.
5. Inequalities and absolute values.

Topic 2 - Number Systems

1. Number systems.
2. Review decimal number system.
3. Binary number system.
4. Octal number system.
5. Hexadecimal number system.
6. Conversion between number systems.
7. Binary addition.
8. Complementation.
9. Binary subtraction.

Topic 3 - Computer Considerations

1. Significant digits, accuracy, precision, rounding.
2. Scientific notation.
3. Normalized exponential form.
4. Integer representation.
5. Floating point representation.

Topic 4 - Sets

1. Sets and elements.
2. Subsets.
3. Operations on sets.
4. Venn diagrams.
5. Basic properties of sets.

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Topic 5 - Logic

1. Simple and compound statements.
2. Truth tables: AND, OR, NOT, NAND, NOR, EOR
3. Conditional and biconditional statements.
4. Properties of logic.
5. Logical implication.
6. Arguments.

Topic 6 - Boolean Algebra

1. Circuits.
2. Combinations off switches.
3. Properties of networks.
4. Simplification of networks.
5. Logic circuits.

Topic 7 - Computer Logic and Programming Structures

1. Algorithms.
- ^{^L} Pseudocode.
- ^{^B} Flow charts.
- Tf.* Decision Structures.
5. Repetition Structures.

III. TOPICS TO BE COVERED:

TIME FRAME (hours)

- | | | |
|----|--|---|
| 1. | Basic Algebra | 3 |
| 2. | Number Systems | 9 |
| 3. | Computer Considerations | 6 |
| 4. | Sets | 6 |
| 5. | Logic | 7 |
| 6. | Boolean Algebra | 9 |
| 7. | Computer Logic & Programming Structure | 5 |

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IV. LEARNING ACTIVITIES:

TIME (HOURS)	UNIT	TOPIC	EXERCISES
3	TOPIC ONE	Number Sets Properties of Integers and Real Numbers Exponents and Radicals Order of Operations	pp. 5 - 6 pp. 9 - 10 pp. 14 - 15 pg. 30 pg. 20
9	TOPIC II	Number Systems Review Decimal Number Systems Binary Number System Octal Number System Hexadecimal Number System Conversion Between Number Systems Binary Addition Complementatation Binary Subtraction	pg. 121 pg. 124 pg. 126 pg. 128 pg. 130 pp. 136-137 pp. 139-140 pg. 142 pp. 148-150 pp. 157-158 pp. 160-161
6	TOPIC III	Significant Digits Precision, Rounding Scientific Notation Normalized Notation, Integer Representation, Floating Point Representation	pg. 176 pp. 177-178 pg. 179 pp. 183-184
6	TOPIC IV	Sets & Elements Subsets Operations on Sets Venn Diagram Basic Properties of Sets	pp. 202-203 pp. 205-206 pp. 208-209 pp. 212-213 pp. 216-217
7	TOPIC V	Simple and Compound Statements Truth Tables: AND, OR, NOT, NAND, NOR, EOR Conditional and Biconditional Statements	pp. 222-223 pp. 226-227 pg. 229 pg. 233

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TIME	UNIT	TOPIC	EXERCISES
7	TOPIC V (cont'd)	Properties of Logic Logical Implication, Arguments	pg. 236 pp. 240-241
9	TOPIC VI	Circuits Combinations of Switches Properties of Networks Simplification of Networks Logic Circuits	pp. 248-249 pp. 251-252 pp. 256-257 pg. 260 pp. 263-264 pp. 267-268
5	TOPIC VII	Algorithms Pseudocode Flow Charts Decision Repetition	pp. 276-277 Handout pp. 279-280 pp. 285-286 pp. 292-294

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.

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VI. REQUIRED STUDENT RESOURCES:

1. Mathematics for Data Processing, Robert N. McCullough. Prentice Hall.
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.