SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

CICE COURSE OUTLINE

COURSE TITLE: Computer Mathematics

CODE NO. : MTH122-4   **SEMESTER:** Fall
MODIFIED CODE:

PROGRAM: Computer Programmer

AUTHOR: Math Department
MODIFIED BY: Anteha Fazi, Learning Specialist CICE Program

DATE: Sept 2015   **PREVIOUS OUTLINE DATED:** Sept 2014

APPROVED: "Angelique Lemay"   Sept 2015

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                         Dean   **DATE**

TOTAL CREDITS: Four

PREREQUISITE(S):

HOURS/WEEK: Three

I.   COURSE DESCRIPTION:

The CICE student, with assistance from a Learning Specialist, will be introduced to and acquire a basic skill level relative to number systems using binary, actual and hexadecimal numbers and Boolean Algebra concepts, Venn diagrams, operations with Fixed-Point numbers. CICE students will collaborate with others to solve problems using input, process and output and an introduction to algorithms and flowcharting. Algebraic applications for programming including language of algebra, exponents, equations and quadratic equations, basic functions and matrices.

II.   LEARNING OUTCOMES:

Upon successful completion of this course, the CICE student, with the help of a Learning Specialist, will demonstrate the basic ability to understand

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
6.   Metric measurement

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
10.   Hexadecimal addition and subtraction

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

II.   LEARNING OUTCOMES (Continued):

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

Topic 5: Logic
1. Simple and compound statements
1. Truth tables: AND, OR, NOT, NAND, NOR, EOR
3. Conditional and bi-conditional statements
    4.   Properties of logic
    5.   Logical implication

Topic 6: Boolean Algebra
1. Circuits
2. Combination off switches
3. Properties of networks
4. Simplification of networks
5. Logic circuits

III. TOPICS TO BE COVERED:

	Textbook Reference	Approximate Time Frame
1. Basic Algebra	Chapter 1	6 hours
2. Number Systems	Chapters 5 & 6	9 hours
3. Computer Considerations	Chapter 7	6 hours
4. Sets	Chapter 8	8 hours
5. Logic	Chapter 9	8 hours
6. Boolean Algebra	Chapter 10	8 hours

UNIT NUMBER	NO. OF HOURS	TOPIC DESCRIPTION	REFERENCE CHAPTER ASSIGNMENTS
1	6	Number Sets	**Problem Set 1.1, Odds**
		Properties of Integers and Real Numbers	*Problem Set 1.2, Odds*
		Exponents and Radicals	*Problem Set 1.3,1.7,Odds*
		Order of Operations	*Problem Set 1.4, Odds*
		Polynomials	*Problem Set 1.5, Odds*
		Equations and Inequalities	*Problem Set 1.6, Odds*
		Metric measurement	*Instructor handout*
2	9	Number Systems	
		Review Decimal Number Systems	*Problem Set 5.1, Odds*
		Binary Number System	*Problem Set 5.2, Odds*
		Octal Number System	*Problem Set 5.3, Odds*
		Hexadecimal Number System	*Problem Set 5.4, Odds*
		Conversion Between Number Systems	*Problem Set 5.5, Odds*
			Problem Set 5.6, Odds
			Problem Set 5.7, Odds
			Problem Set 5.8, Odds
		Binary Addition	*Problem Set 6.1, Odds*
		Octal and Hexadecimal Addition	*Problem Set 6.2, Odds*
		and Subtraction	**Problem Set 6.3, Odds**
			Problem Set 6.4, Odds
		Binary Subtraction	
3	6	Significant Digits	*Problem Set 7.1, Odds*
		Precision, Rounding	
		Scientific Notation	*Problem Set 7.2, Odds*
		Normalized Notation, Integer	
		Representation, Floating Point	
		Representation	*Problem Set 7.3, Odds*
		Real Numbers	*Problem Set 7.4, Odds*
4	8	Sets and Elements	*Problem Set 8.1, Odds*
		Subsets	*Problem Set 8.2, Odds*
		Operations on Sets	*Problem Set 8.3, Odds*
		Venn Diagram	*Problem Set 8.4, Odds*
		Basic Properties of Sets	*Problem Set 8.5, Odds*
5	8	Simple and Compound Statements	*Problem Set 9.1, Odds*
		Truth Tables: AND, OR, NOT, NAND, NOR, EOR	*Problem Set 9.2, Odds* *Problem Set 9.3, Odds*
		Conditional and Bi-conditional Statements	*Problem Set 9.4, Odds*
		Properties of Logic	*Problem Set 9.5, Odds*
		Logical Implication, Arguments	*Problem Set 9.6, Odds*

UNIT NUMBER	NO. OF HOURS	TOPIC DESCRIPTION	REFERENCE CHAPTER ASSIGNMENTS
6	8	Circuits	*Problem Set 10.1, Odds*
			Problem Set 10.2, Odds
		Combinations of Switches	*Problem Set 10.3, Odds*
		Properties of Networks	*Problem Set 10.4, Odds*
		Simplification of Networks	*Problem Set 10.5, Odds*
		Logic Circuits	*Problem Set 10.7, Odds*

IV. REQUIRED RESOURCES / TEXTS / MATERIALS:

1. Textbook: "Mathematics for Data Processing", Robert N. McCullough, *Third Edition,* Prentice-Hall.

3. Calculator: (Recommended) SHARP Scientific Calculator EL-546. The use of some kinds of calculators may be restricted during tests.

V. EVALUATION PROCESS/GRADING SYSTEM:
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Evaluation Device	Topics Covered (topic numbers refer to the course outline)	% weight of Final Average
Test 1	1	10%
Test 2	2	20%
Test 3	3	10%
Test 4	4	20%
Test 5	5	20%
Test 6	6	20%

All tests will be completed with the assistance of the Learning Specialist. Any modifications to the tests will be proposed by the Learning Specialist and are subject to approval from the professor

METHOD OF ASSESSMENT (GRADING METHOD)

Grade	Definition	Grade Point Equivalent
A+	90 – 100%	4.00
A	80 – 89%	
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00

F (Fail)	49% and below	0.00

CR (Credit)	Credit for diploma requirements has been awarded.
S	Satisfactory achievement in field /clinical placement or non-graded subject area.
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
NR	Grade not reported to Registrar's office.
W	Student has withdrawn from the course without academic penalty.

If a faculty member determines that a student is at risk of not being successful in their academic pursuits and has exhausted all strategies available to faculty, student contact information may be confidentially provided to Student Services in an effort to offer even more assistance with options for success. Any student wishing to restrict the sharing of such information should make their wishes known to the coordinator or faculty member.

Unexcused absence from a test may result in a mark of zero ("0"). Absence may be excused on compassionate grounds such as verified illness 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.

VI.   SPECIAL NOTES:

Attendance:
Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

Electronic Devices:
Personal use of electronic devices such as cell phones, iPods, MP3 players, tablets, laptop computers etc. during class is prohibited except as indicated in the addendum below.

Addendum:
Further modifications may be required as needed as the semester progresses based on individual student(s) abilities and must be discussed with and agreed upon by the instructor.

CICE Modifications:

Preparation and Participation

1. A Learning Specialist will attend class with the student(s) to assist with inclusion in the class and to take notes.
2. Students will receive support in and outside of the classroom (i.e. tutoring, assistance with homework and assignments, preparation for exams, tests and quizzes.)
3. Study notes will be geared to test content and style which will match with modified learning outcomes.
4. Although the Learning Specialist may not attend all classes with the student(s), support will always be available. When the Learning Specialist does attend classes he/she will remain as inconspicuous as possible.

A. Tests may be modified in the following ways:

1. Tests, which require essay answers, may be modified to short answers.
2. Short answer questions may be changed to multiple choice or the question may be simplified so the answer will reflect a basic understanding.
3. Tests, which use fill in the blank format, may be modified to include a few choices for each question, or a list of choices for all questions. This will allow the student to match or use visual clues.
4. Tests in the T/F or multiple choice format may be modified by rewording or clarifying statements into layman's or simplified terms. Multiple choice questions may have a reduced number of choices.

B. Tests will be written in CICE office with assistance from a Learning Specialist.

The Learning Specialist may:

1. Read the test question to the student.
2. Paraphrase the test question without revealing any key words or definitions.
3. Transcribe the student's verbal answer.
4. Test length may be reduced and time allowed to complete test may be increased.

C. Assignments may be modified in the following ways:

1. Assignments may be modified by reducing the amount of information required while maintaining general concepts.
2. Some assignments may be eliminated depending on the number of assignments required in the particular course.

The Learning Specialist may:

1. Use a question/answer format instead of essay/research format
2. Propose a reduction in the number of references required for an assignment
3. Assist with groups to ensure that student comprehends his/her role within the group
4. Require an extension on due dates due to the fact that some students may require additional time to process information
5. Formally summarize articles and assigned readings to isolate main points for the student
6. Use questioning techniques and paraphrasing to assist in student comprehension of an assignment

D. Evaluation:

Is reflective of modified learning outcomes.