THE SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

SAULT COLLEGE

COURSE OUTLINE

COURSE TITLE: Computer Mathematics

CODE NO. : MTH122-4 **SEMESTER:** One

PROGRAM: Computer Programmer

AUTHOR: Math Department

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

APPROVED: "Colin Kirkwood" July/15

_____ _____
        DEAN   **DATE**

TOTAL CREDITS: 4

PREREQUISITE(S): None

HOURS/WEEK: 3 hours/week

I.   COURSE DESCRIPTION:

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

II.   LEARNING OUTCOMES:

After studying each of the indicated topics, the student should be able to perform necessary applications to solve related problems with in program:

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

Computer Mathematics   MTH 122-4

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

Computer Mathematics   MTH 122-4

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

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%

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.

VII.   COURSE OUTLINE ADDENDUM:

1.   Course Outline Amendments:
      The faculty member reserves the right to change the information contained in this course outline
      depending on the needs of the learner and the availability of resources.

2.   Retention of Course Outlines:
      It is the responsibility of the student to retain all course outlines for possible future use in acquiring
      advanced standing at other postsecondary institutions.

Computer Mathematics   MTH 122-4

3.   <u>Prior Learning Assessment</u>**:**
     Students who wish to apply for advance credit transfer (advanced standing) should obtain an
     Application for Advance Credit from the program coordinator (or the course coordinator regarding a
     general education transfer request) or academic assistant. Students will be required to provide an
     unofficial transcript and course outline related to the course in question. Please refer to the Student
     Key Dates Calendar for the deadline date by which application must be made for advance standing.

     Credit for prior learning will also be given upon successful completion of a challenge exam or
     portfolio. Student Services, located in E1101, can provide information regarding the Prior Learning
     Assessment and Recognition policy or it can be viewed on the student portal.

     Substitute course information is available in the Registrar's office.

4.   <u>Student Portal:</u>
     The Sault College portal allows you to view all your student information in one place.
     mysaultcollege gives you personalized access to online resources seven days a week from your
     home or school computer. Single log-in access allows you to see your personal and financial
     information, timetable, grades, records of achievement, unofficial transcript, and outstanding
     obligations, in addition to announcements, news, academic calendar of events, class cancellations,
     your learning management system (LMS), and much more. Go to https://my.saultcollege.ca.

5.   <u>Communication:</u>
     The College considers ***Desire2Learn (D2L)*** as the primary channel of communication for each
     course. Regularly checking this software platform is critical as it will keep you directly connected with
     faculty and current course information. Success in this course may be directly related to your
     willingness to take advantage of this Learning Management System (LMS) communication tool.

6.   <u>Accessibility Services</u>:
     If you are a student with a disability (e.g. physical limitations, visual impairments, hearing
     impairments, or learning disabilities), you are encouraged to discuss required accommodations with
     the Accessibility Services office. Visit Room E1101, call Ext. 2703 or email
     studentsupport@saultcollege.ca so that support services can be arranged for you.

7.   <u>Audio and Video Recording Devices in the Classroom:</u>
     Students who wish to use electronic devices in the classroom will seek permission of the faculty
     member before proceeding to record instruction. Students with disabilities who require audio or visual
     recording devices in the classroom as an accommodation will receive approval from their counsellor once
     the Audio and Video Recording Devices in the Classroom Policy has been reviewed by the
     student. Recorded classroom instruction will be used only for individual academic use and will not be
     used for any other purpose. Recordings may only be used for individual study of materials presented
     during class and may not be published or distributed. Intentional misuse of audio and video recordings or
     intentional misrepresentation when requesting the use of a device for recording shall constitute a
     violation of this policy and laws protecting intellectual property.

8.   <u>Academic Dishonesty</u>:
Students should refer to the definition of "academic dishonesty" in the *Student Code of Conduct*. Students who engage in academic dishonesty will be issued a sanction under the Student Code of Conduct which could lead to and include expulsion from the course/program. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, students must use a documentation format for referencing source material.

9.   <u>Tuition Default:</u>
Students who have defaulted on the payment of tuition (tuition has not been paid in full, payments were not deferred or payment plan not honoured) as of the first week of November (fall semester courses), first week of March (winter semester courses) or first week of June (summer semester courses) will be removed from placement and clinical activities due to liability issues. This may result in loss of mandatory hours or incomplete course work. Sault College will not be responsible for incomplete hours or outcomes that are not achieved or any other academic requirement not met as of the result of tuition default. Students are encouraged to communicate with Financial Services with regard to the status of their tuition prior to this deadline to ensure that their financial status does not interfere with academic progress.