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| **THE SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**  **SAULT STE. MARIE, ONTARIO**   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 | | | | |
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| *For additional information, please contact* *Colin Kirkwood, Dean, School of Environment, Technology and Business (705) 759-2554, Ext. 2688* | | | | | |
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**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

1. Order of operations

5. Inequalities and absolute values

1. 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

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| **III. TOPICS TO BE COVERED:** | **Textbook**  **Reference** | **Approximate Time Frame** |

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| 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 |

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| **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*** |

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| **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.

1. 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% |

**METHOD OF ASSESSMENT (GRADING METHOD)**

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|  | 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 |
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|  | 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.

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| |  |  |  | | --- | --- | --- | | **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. | |
| 3. | | Prior Learning Assessment**:**  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. | | Student Portal:  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. | | Communication:  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. | | Accessibility Services:  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](mailto:studentsupport@saultcollege.ca) so that support services can be arranged for you. | |
| 7. | | Audio and Video Recording Devices in the Classroom:  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. | | Academic Dishonesty:  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. | | Tuition Default:  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. | |