# SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

# SAULT STE. MARIE, ONTARIO

## COURSE OJJTJJNE

**COURSE TITLE:** COLLEGE PREPARATORY MATHEMATICS

**CODE NO.:** MTH097-5     **SEMESTER:**

**PROGRAM:** GENERAL ARTS & SCIENCE - COLLEGE PREPARATORY

**AUTHOR:** JOHN GIGUERE

**DATE:** _     MAY 1995          JULY 1994
**PREVIOUS OUTLINE DATED:**

**APPROVED:**   k/U<sub>DEAN</sub>   *M    n*          J ><sup>ATE</sup>

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**COURSE NAME**                                     **COURSE NUMBER**
**TOTAL CREDIT HOURS: 85**
**PREREQUISITE:** NONE
**SUBSTITUTE:** MTH 098

## I. PHILOSOPHY/GOALS:

The objectives of this course are to increase the student's speed, accuracy and skill in performing basic arithmetic calculations and operations on algebraic expressions, as well as the solution of practical problems involving linear equations in one variable.

A study of measurement will enable the student to use metric and Imperial units of length, capacity and mass and to change from one system of units to the other.

Emphasis will be placed on developing the student's ability to state a ratio in simplified form, and to solve basic problems dealing with direct and inverse proportions.

## II. STUDENT PERFORMANCE OBJECTIVES:

The basic objectives are that the student will develop an understanding of the methods studied, demonstrate a knowledge of the facts presented and show an ability to use these in the solution of problems.  To accomplish these objectives, exercises are assigned.  Test questions will be of near equal difficulty to questions assigned in the exercises.  The level of competency demanded is the level required to obtain an overall passing average on the tests.  The material to be covered is listed below.

## III.  TOPICS TO BE COVERED:          TIME FRAME:          n>c.

1.   Review of Whole numbers,            28 hours
     Fractions, Decimals, Percent
     and their operations.

2.   Metric and Imperial                 16 hours
     systems of measurement.

3.   Ratio and Proportion.               14 hours

4.   Integers, algebraic expressions     16 hours
     and linear equations in one
     variable.

5.   The Pythagorean Theorem              3 hours

6.   Introduction to Geometry             8 hours
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                                         85 hours

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

REVIEW                                                    TEXT:  BASIC MATHEMATICAL
                                                                SKILLS WITH GEOMETRY
                                                         - James Streeter, Donald Hutchinson, &
                                                         Louis Hoelzle THIRD EDITION

                                                         Exercises are to be done <u>without</u> the aid
                                                         of a calculator.

| | | | |
|---|---|---|---|
| 1.0 | <u>WHOLE NUMBERS</u> | | |
| 1.1 | Determining the place value of a digit<br>Writing a numeral in words<br>Writing a numeral, given its word name | 1.1 | (pg-9 - 10) |
| 1.2 | Adding any group of whole numbers | 1.5 | (pg.29-30) |
| 1.3 | Rounding a whole number to any place value<br>Estimating sums by rounding<br>Using the symb-Ji < and > | 1.6 | (pg. 43-46) |
| 1.4 | Subtracting whole numbers<br>Estimating differences by rounding | 1.8 | (pg. 57-62) |
| 1.5 | Solving word problems involving addition and subtraction of whole numbers | 1.9 | (pg. 71-76) |
| 1.6 | Multiplying any two whole numbers | 2.4 | (pg. 103-106) |
| 1.7 | Multiplying by whole numbers ending in zero<br>Estimating products by rounding | 2.5 | (pg. 111-114) |
| A l . 8 | Order of Operations | 2.6 | (pg. 117-118) |
| 1.9 | Solving word problems involving multiplication of whole numbers | 2.7 | (pg. 127-132) |

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## IV. LEARNING ACTIVITIES:      REQUIRED RESOURCES:

| | | | | |
|---|---|---|---|---|
| 1.10 | Dividing with zero and one | 3.2 | **(pg-** | 157-158) |
| | Dividing whole numbers by single digit numbers | 3.3 | **(pg-** | 163-165) |
| 1.11 | Dividing whole numbers by two or three digit numbers | 3.4 | (pg- | 173-174) |
| 1.12 | Using the rules for the order of operations | 3.6 | **(pg-** | 179-182) |
| 1.13 | Solving word problems involving division of whole numbers | 3.7 | (pg- | 189-192) |
| 1.14 | Finding the average of a group of whole numbers | 3.8 | (pg- | 195-198) |
| 1.15 | Powers of whole numbers | 2.8 | (pg- | 137-141) |

| | | |
|---|---|---|
| 2.0 | **FRACTIONS** | **Exercises are to be done without of a calculator.** |
| 2.1 | Finding the prime factors of a whole number | 4.2     (pg. 215-216) |
| 2.2 | Finding the lowest common multiple (LCM) of a group of numbers | 4.4     (pg. 229-230) |
| 2.3 | Identifying proper fractions, improper fractions and mixed numbers | 5.2     (pg. 259-260) |
| 2.4 | Converting from one type of fraction to another | 5.3     (pg. 265-266) |
| 2.5 | Equivalent fractions | 5.4     (pg. 269-270) |
| 2.6 | Simplifying fractions by reducing to lowest terms | 5.5     (pg. 277-280) |

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

| | | | |
|---|---|---|---|
| 2.7 | Building fractions | **5.6** | (pg. 289-292) |
| 2.8 | Multiplying fractions | **6.1 & 6.2** | (pg. 299-300)<br>(pg. 305-308) |
| 2.9 | Dividing fractions | 6.4 | **(pg. 331-334)** |
| 2.10 | Finding the least common denominator (LCD) for a group of fractions | 7.2 | (pg. 349-350) |
| 2.11 | Adding fractions | 7.3 | (pg. 355-358) |
| 2.12 | Subtracting fractions | 7.4 | (pg. 363-366) |
| 2.13 | Adding and subtracting mixed numbers | 7.5 | (pg. 375-378) |
| '14 | Solving word problems involving fractions | **7.6** | (pg. 383-388) |

3.0  <u>DECIMALS</u>

Exercises are to be done <u>without</u> the aid of a calculator.

| | | | |
|---|---|---|---|
| 3.1 | Identifying place values in decimal fractions<br>Writing decimal fractions in words<br>Writing decimal fractions, given their word forms<br>Comparing the sizes of decimal fractions | 8.1 | (pg. 411-414) |
| 3.2 | Rounding decimals | 8.2 | (pg. 417-418) |
| 3.3 | Adding decimals | 8.3 | (pg. 423-428) |
| 3.4 | Subtracting decimals | 8.4 | (pg. 433-437) |
| 3.5 | Multiplying decimals | 8.5 | (pg. 445-449) |

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| IV. | **LEARNING ACTIVITIES:** | | **REQUIRED RESOURCES:** |
|---|---|---|---|
| 3.6 | Dividing a decimal by a whole number | 9.1 | (pg. 467-470) |
| 3.7 | Dividing a decimal by a decimal. | 9.2 | (pg. 477-480) |
| 3.8 | Converting a common fraction to a decimal<br>Comparing the sizes of common fractions and decimals | 9.4 | (pg. 493-495) |
| 3.9 | Converting a decimal to a common fraction | 9.5 | **(pg. 501-502)** |
| **4.0** | **EERCEALI** | | Exercises are to be done <u>without</u> the aid of a calculator. |
| 4.1 | Describing what is meant by "per cent" | **11.1** | **(pg. 563-564)** |
| 4.2 | Changing a percent to a common fraction or mixed number<br>Changing a percent to a decimal | **11.2** | (pg. 569-572) |
| 4.3 | Changing a decimal or a fraction to a percent | 11.3 | (pg. 577-580) |
| 4.4 | Identifying and finding the rate, base and amount in an application | 11.4<br>11.5 | (pg. 585-588)<br>(pg. 597-600) |
| 4.5 | Solving word problems involving percentage | 11.6 | (pg. 609-616) |

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| IV. LEARNING ACTIVITIES: | REQUIRED RESOURCES: |
|---|---|
| **5.0 <u>MEASUREMENT</u>** | Exercises are to be done <u>with</u> the aid of a calculator |
| 5.1 Metric prefixes | Handout assignments |
| 5.2 Metric units of length | **13.1 (pp. 709-724)** |
| 5.3 Converting between metric and imperial units of length | Handout assignments |
| 5.4 Metric units of capacity | 13.3 (pg. 725-727) |
| 5.5 Converting between metric and imperial units of capacity | Handout assignments |
| 6 Metric units of mass | 13.2 (pg. 717-720) |
| 5.7 Converting between metric and imperial units of mass | Handout assignments |
| **<u>6</u>.0 RATIO AND PROPORTION** | Exercises are to be done <u>with</u> the aid of a calculator. |
| 6.1 Writing the ratio of two or more numbers or quantities in simplest form | **10.1 (pg.521-524)** |
| 6.2 Determining whether or not a given proportion is a true statement | **10.2** (pg. 529-532) |
| 6.3 Solving a proportion for an unknown term | **10.3** (pg. 537-540) |
| 6.4 Solving word problems by using proportions | **10.4** (pg. 545-550) |

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

| | | | |
|---|---|---|---|
| 7.0 | <u>INTEGERS</u> | Exercises are to be done <u>with</u> the aid of a calculator | |
| 7.1 | Describing what is meant by an "integer" Finding the opposite and absolute value of a number | **16.1** | **(pg. 829-832)** |
| 7.2 | Adding signed numbers | **16.2** | **(pg. 841-844)** |
| 7.3 | Subtracting signed numbers | **16.3** | **(pg. 849-852)** |
| 7.4 | Multiplying signed numbers | **16.4** | **(pg. 859-862)** |
| 7.5 | Dividing signed numbers | **16.5** | **(pg. 865-868)** |
| 8.0 | <u>ALGEBRAIC EXPRESSIONS AND EQUATIONS</u> | Exercises are to be done <u>with</u> the aid of a calculator | |
| 8.1 | Evaluating algebraic expressions, given specified values for the variables | **17.1** | **(pg. 879-882)** |
| 8.2 | Solving equations in one variable | **17.2** **17.3** | **(pg. 895-898)** **(pg. 909-912)** |
| 8.3 | Translating a word phrase to an algebraic expression Solving applications using algebraic equations in one variable | **17.4** | **(pg. 921-926)** |
| **9.0** | **THE PYTHAGOREAN THEOREM** | Exercises are to be done <u>with</u> the aid of a calculator. | |
| **9.1** | Application | **14.3** | **(pg. 761-765)** |

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10.0  <u>INTRODUCTION TO</u>          Exercises are to be done <u>with</u> the aid of a
      **GEOMETRY**                     calculator

10.1  Perimeter and Circumferences    **12.3**        **(pg. 657-666)**

10.2  Area                            **12.4**        **(pg. 669-681)**

10.3  Volume                          **12.5**        **(pg. 685-692)**

## V. METHOD OF EVALUATION:

The final grade will be derived from the results of topic tests each of which will constitute 25% of the final mark. The grading system used will be as follows:

```
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%.

## VI. REQUIRED STUDENT RESOURCES:

1. TEXTBOOK:  BASIC MATH SKILLS, 3rd Edition, Streeter and Alexander.

2. An electronic calculator will be required for topics 2, 3 and 4. The use of some kinds of calculators may be restricted during tests. Recommended: SHARP Scientific Calculator EL-531G.

## VII. ADDITIONAL RESOURCE MATERIALS:

Consult the clerk(s) in the Learning Resource Centre and/or the Learning Assistance Centre.

## VIII. 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 eeds of students.