SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE MARIE, ON

COURSE OUTLINE

Course Title: College Preparatory Mathematics

Code No.; Mth 93-5 **Semester; Fall/Winter**

Program: Access

Author: The Mathematics Department

Date: August 1998 **Previous Outline Dated: June 1997**

Approved: *\li<AJJ~£- %(U^<?_ J (L^J* **T>-**
' Dean ' *(J* Date

Total Credits: 5 **Prerequisite(s):**
Substitute(s):
Length of Course: 5 hrs./week **Total Credit Hours:**

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I. COURSE DESCRIPTION:

The objectives of this course are to develop the student's skill in performing algebraic operations including exponents, radicals, fractional equations, and variation and in solving and graphing linear and quadratic equations.

Technical Option:
A survey of geometry will enable the student to identify a variety of basic plan and solid figures encountered and to determine their perimeters, areas, and volumes appropriately in both British and metric units.

The student will use trigonometry to find both sides and angles in right and oblique triangles.

Business Option:
The student's skill in solving problems involving percent will be developed.

An introduction will be made to the mathematics of buying and selling.

The student will solve for the unknown quantity in simple interest, bank discount, compound interest, and present value questions.

II. STUDENT PERFORMANCE OBJECTIVES:

The basic objectives are that the student will develop an understanding of the method studied, demonstrate a knowledge of the facts presented and show an ability to use them in the solution of problems. To accomplish these objectives, exercises are assigned. The 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 rests. The material to be covered is listed below.

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I. TOPICS TO BE COVERED:

	Approximate Time Frame
1. Basic Concepts	5 hours
2. Exponents and Radicals	5 hours
3. Fractional Equations	5 hours
4. Variation	5 hours
5. Graphing Linear Equations	10 hours
6. Quadratics and Circles	10 hours
	40 HOURS

Technical Option:

7. Units of Measurement	10 hours
8. Geometry	15 hours
9. Trigonometry	10 hours
10. Statistics	5 hours
	40 HOURS

Business Option:

11. Percent	5 hours
12. Mathematics of Buying and Selling	15 hours
13. Simple Interest	10 hours
14. Bank Discount, Compound Interest, and Present Value	5 hours
	40 HOURS

IV. LEARNING ACTIVITIES:

TOPIC DESCRIPTION	REQUIRED STUDENT TEXTBOOK	REFERENCE CHAPTER ASSIGNMENTS
BASIC CONCEPTS		
Order of Operations	Ewen	Ex. 1.2 pages 10-13
Addition of Signed Numbers	Ewen	Ex. 1.6 pages 28-32
Subtraction of Signed Numbers	Ewen	Ex. 1.7 pages 32-34
Multiplication and Division of Signed Numbers	Ewen	Ex. 1.8 pages 34-36
Addition of Real Numbers	Keedy	Ex. 3.3 pages 177-182
Subtraction of Real Numbers	Keedy	Ex. 3.4 pages 183-190
Multiplication of Real Numbers	Keedy	Ex. 3.5 pages 191-196
Division of Real Numbers	Keedy	Ex. 3.6 pages 197-202
Properties of Real Numbers	Keedy	Ex. 3.7 pages 203-214
EXPONENTS AND RADICALS		
Multiplication of Monomials	Ewen	Ex. 6.4 pages 210-212
Division by a Monomial	Ewen	Ex. 6.6 pages 215-217
Radicals	Ewen	Handout
Exponential Notation and Order of Operations	Keedy	Ex. 3.8 pages 215-222
Properties of Exponents and Scientific Notation	Keedy	Ex. 3.9 pages 223-232
Introduction to Roots and Radical Expressions	Keedy	Ex. 10.1 pages 609-614
Multiplying and Simplifying Radical Expressions	Keedy	Ex. 10.2 pages 615-620
Operations with Radical Expressions	Keedy	Ex. 10.4 pages 625-630
Rational Numbers as Exponents	Keedy	Ex. 10.6 pages 639-644
FRACTIONAL EQUATIONS		
Equations with Fractions	Ewen	Ex. 7.4 pages 233-237
Formulas	Ewen	Ex. 7.7 pages 244-247
Substituting Data into Formulas	Ewen	Ex. 7.8 pages 247-251
Solving Rational Equations	Keedy	Ex. 9.3 pages 567-572
Formulas	Keedy	Ex. 9.5 pages 583-586
VARIATION		
Direct Variation	Ewen	Ex. 8.4 pages 268-275
Inverse Variation	Ewen	Ex. 8.5 pages 275-279
Variation	Keedy	Ex. 9.7 pages 593-602

IV. LEARNING ACTIVITIES (Continued):

TOPIC DESCRIPTION	REQUIRED STUDENT TEXTBOOK	REFERENCE CHAPTER ASSIGNMENTS
GRAPHING LINEAR EQUATIONS		
Linear Equations in Two Variables	Ewen	Ex. 9.1 pages 282-288
Graphing Linear Equations	Ewen	Ex. 9.2 pages 288-294
Slope of a Line	Ewen	Ex. 9.3 pages 294-301
Equation of a Line	Ewen	Ex. 9.4 pages 301-306
Solving Pairs of Linear Equations by Graphing	Ewen	Ex. 10.1 pages 309-315
Graphs	Keedy	Ex. 5.1 pages 303-310
Graphing Linear Equations	Keedy	Ex. 5.2 pages 311-316
Graphing Using Slope and Y-intercept	Keedy	Ex. 5.3 pages 317-326
Other Equations of Lines	Keedy	Ex. 5.4 pages 327-332
Graphing Inequalities in Two Variables	Keedy	Ex. 5.6 pages 337-342
QUADRATICS AND CIRCLES		
Solving Quadratic Equations by Factoring	Ewen	Ex. 12.1 pages 346-349
Quadratic Formula (omit word problems)	Ewen	Ex. 12.2 pages 349-352
Graphs of Quadratic Equations	Ewen	Ex. 12.3 pages 353-358
Circles		Handout
Basics of Solving Quadratic Equations	Keedy	Ex. 11.1 pages 671-680
Quadratic Formula	Keedy	Ex. 11.2 pages 681-686
Parabolas and Circles	Keedy	Ex. 12.1 pages 743-752
UNITS OF MEASUREMENT (Technical Option)		
Introduction to the Metric System	Ewen	Ex. 4.1 pages 121-124
Length	Ewen	Ex. 4.2 pages 124-128
Mass and Weight	Ewen	Ex. 4.3 pages 128-130
Volume and Area	Ewen	Ex. 4.4 pages 130-134
Time	Ewen	Ex. 4.5 pages 134-139
Temperature	Ewen	Ex. 4.6 pages 136-138
Metric and English Conversion	Ewen	Ex. 4.7 pages 139-143
Linear Measures - British and Metric	Keedy	Appendix A
Capacity, Weight, Mass and Time	Keedy	Appendix B

IV. LEARNING ACTIVITIES (Continued):

TOPIC DESCRIPTION	REQUIRED STUDENT TEXTBOOK	REFERENCE CHAPTER ASSIGNMENTS
GEOMETRY (Technical Option)		
Angles and Polygons	Ewen	Ex. 13.1 pages 363-371
Quadrilaterals	Ewen	Ex. 13.2 pages 371-376
Triangles	Ewen	Ex. 13.3 pages 376-387
Similar Triangles	Ewen	Ex. 13.4 pages 387-391
Circles	Ewen	Ex. 13.5 pages 392-400
Radian Measure	Ewen	Ex. 13.6 pages 400-405
Prisms	Ewen	Ex. 13.7 pages 405-409
Cylinders	Ewen	Ex. 13.8 pages 409-414
Pyramids and Cones	Ewen	Ex. 13.9 pages 415-421
Spheres	Ewen	Ex. 13.9 pages 422-424
Right Angles and Pythagorean Theorem	Keedy	Appendix C
Basic Geometric Figures	Keedy	Ex. 7.1 pages 401-410
Perimeter	Keedy	Ex. 7.2 pages 411-414
Area-Rectangles and Squares	Keedy	Ex. 7.3 pages 415-418
Area-Parallelograms, Triangles and Trapezoids	Keedy	Ex. 7.4 pages 419-424
Circles	Keedy	Ex. 7.5 pages 425-432
Volume and Surface Area	Keedy	Ex. 7.6 pages 433-440
Similar Triangles	Keedy	Ex. 7.9 pages 461-466
TRIGONOMETRY (Technical Option)		
Trigonometric Ratios	Ewen	Ex. 14.1 Pages 429-434
Using Trigonometric Ratios to Find Angles	Ewen	Ex.14.2 Pages 434-437
Using Trigonometric Rations to Find Sides	Ewen	Ex.14.3 Pages 437-439
Solving Right Triangles	Ewen	Ex.14.4 Pages 439-442
Solving Oblique Triangles: Law of Sines	Ewen	Ex.14.8 Pages 459-463
Solving Oblique Triangles: Law of Cosines	Ewen	Ex.14.10 Pages 469-474
Angles and Rotation	Keedy	Ex. 12.1* Pages 2-6
Trigonometric Functions	Keedy	Ex. 12.2* Pages 7-12
Trigonometric Functions and Right Triangles	Keedy	Ex. 12.3* Pages 13-18
Solving Right Triangles and Applications	Keedy	Ex. 12.4* Pages 19-24
Law of Sines	Keedy	Ex. 12.5* Pages 25-28
Law of Cosines	Keedy	Ex. 12.6* Pages 29-32
		*** from the fourth edition available as a supplement to the sixth edition**

IV. LEARNING ACTIVITIES (Continued):

TOPIC DESCRIPTION	REQUIRED STUDENT TEXTBOOK	REFERENCE CHAPTER ASSIGNMENTS
STATISTICS (Technical Option)		
Other Graphs	Ewen	Ex. 15.4 pages 490-492
Mean Measurement	Ewen	Ex. 15.5 pages 492-493
Grouped Data	Ewen	Ex. 15.7 pages 496-503
Variance and Standard Deviation	Ewen	Ex. 15.8 pages 503-506
Basic Descriptive Statistics	Keedy	Handout

IV. LEARNING ACTIVITIES (Business Option):

TOPIC DESCRIPTION	REFERENCE CHAPTER ASSIGNMENTS
PERCENT (Business Option)	
Numbers and Percent	Ex. 4.1 Pages 119-130
Percent Problems	Ex. 4.2 Pages 131-145
MATHEMATICS OF BUYING AND SELLING (Business Option)	
	Ex. 5.1 Pages 149-160
Trade Discounts	Ex. 5.2 Pages 161-168
Cash Discounts	Ex. 5.3 Pages 169-178
Inventory Valuation	Ex. 5.4 Pages 179-191
Markup	Ex. 5.5 Pages 193-198
Markdown and Tax	
SIMPLE INTEREST (Business Option)	
Time	Ex. 7.1 Pages 249-258
Calculating Simple Interest	Ex. 7.2 Pages 259-269
Solving for Other Interest Variables	Ex. 7.3 Pages 271-283
BANK DISCOUNT, COMPOUND INTEREST AND PRESENT VALUE (Business Option)	
Bank Discount	Ex. 8.1 Pages 287-296
Compound Interest (omit tables; use formula p. 307)	Ex. 8.2 Pages 297-304
Present Value (omit tables; use formula p. 307)	Ex. 8.3 Pages 305-310

V. REQUIRED RESOURCES / TEXTS / MATERIALS:

1. Textbook: Ewen, D. and Nelson, R. (1994), "Elementary Technical Mathematics", Sixth Edition, Toronto: PWS Publishing Company.

   The Business Option section requires the textbook: "Mathematics for Business Careers", Second Edition, by Cain and Carman. This textbook may be available from the Learning Assistance Centre.

   During the 1997/98 school year, those students who have already purchased the textbook, "Essential Mathematics", by Keedy, Bittinger, and Rudolph may continue to use their textbook.

2. Calculator: (Recommended) SHARP Scientific Calculator EL-531G. The use of some kinds of calculators may be restricted during tests.

VI. EVALUATION PROCESS/GRADING SYSTEM:

Pretest

There is a pretest for each module of MTH 93. You can choose to do the pretest for a particular module when you reach it during the course. If you score 80% or better on a pretest, you will be exempted from the module. You can complete modules that you have been exempted from; however, no test marks will be recorded for those modules. You will receive credit (CR) only.

Should pretesting indicate that you need to complete two or less modules, you will be granted a credit for the course after you have completed some supplemental work and further assessment. The professor of the course for which credit is being granted will arrange for your supplemental work and assessment.

Attendance

It is your responsibility to attend all classes during the semester. Research indicates there is a high correlation between attendance and student success.

Assignments and Tests

The MTH 93 course is delivered in a student-paced mode. You work through the module at your own pace. You decide when you are ready to be evaluated on each module.

The Module topics and the text book references, including assignment pages, are listed in the "Learning Activities" section of this course outline.

VI. EVALUATION PROCESS/GRADING SYSTEM (cont'd):

You may find the method outlined below helpful as you begin to work on your course:

A. Complete the Module

1. Read through each teaching section.
2. Take notes on all main points and give examples.
3. Practise the skill using questions in the exercises provided. Complete all work showing the steps required to solve.
4. Determine whether you are ready to proceed by checking your answers in the answer keys.
5. Discuss any questions with your professor before going ahead to the next skill.
6. Complete enough questions to ensure understanding of the skill.
7. Proceed to the next skill and repeat the above instructions.

B. Complete the Review

1. Review your notes and examples as well as any appropriate "Summary of Chapters" from the text.
2. Answer all questions on appropriate Self-Tests without checking back to instructional modules.
3. Check your answers in the answer keys.
4. Review any problems from the Self-Tests with your professor to ensure understanding.

C. Write the Test

1. Let your professor know you are ready to write the test so that the testing form can be completed.
2. Arrange to write your test at the Testing Centre.
3. Write the test at the arranged time. Bring all necessary supplies.
4. Obtain results from your professor.
5. Review your test noting any areas that require further work.
6. Proceed to next module once minimum pass grade has been reached.

You will need a 60%* or better to pass a module. If you score below 60%*, you will be allowed to write a second test after further study. If you score below 60%* on the second test, you will meet with the professor to discuss the matter. The marks of all tests required to pass a module will be averaged to determine the module grade.

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VI. EVALUATION PROCESS/GRADING SYSTEM (cont'd):

All module grades will be averaged to determine the final grade. If your average is below 60%* you will still pass the course provided you have passed all the modules. The College grading system* will be used to assign letter grades.

METHOD OF ASSESSMENT (GRADING METHOD):

A+	Consistently outstanding	(90%-100%)
A	Outstanding Achievement	(80% - 89%)
B	Consistently above average achievement	(70% - 79%)
C	Satisfactory or acceptable achievement in all areas subject to assessment	(60% - 69%)
X or R	A temporary grade, limited to situations with extenuating circumstances, giving a student additional time to complete course requirements **(See below)**	
R	Repeat - The student has not achieved the objectives of the course, and the course must be repeated	(0% - 59%)
CR	Credit exemption	

An "X" grade will be issued to a student who has not completed all the required course modules in a semester, provided the student has attended 80% of the classes, has shown regular progress and will be able to complete the course within a limited amount of time.

If an "X" grade is not cleared by the specified date, it will become an "R" grade.

VII. SPECIAL NOTES:

Special Needs
If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities), you are encouraged to discuss required accommodations with the instructor and/or contact the Special Needs Office, Room E1204, Ext. 493, 717, 491 so that support services can be arranged for you.

Advanced Standing
Students who have completed an equivalent post-secondary course must bring relevant documents to the Coordinator, Mathematics Department.

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VII. SPECIAL NOTES:

Retention of Course Outlines
It is the responsibility of the student to retain all course outlines for possible future use in gaining advanced standing at other post-secondary institutions.

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

The instructor reserves the right to alter the course as he/she deems necessary to meet the needs of the students.

VIII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the instructor or the Prior Learning Assessment Office (E2203).