

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: College Preparatory Mathematics

CODE NO: MTH 93-5

SEMESTER:

PROGRAM: General Arts and Science

AUTHOR: John McGauley and Elizabeth Kontschieder

DATE: June 1997

PREVIOUS OUTLINE DATED: June 1996

APPROVED:

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TOTAL CREDITS:

PREREQUISITES:

LENGTH OF COURSE:

TOTAL CREDIT HOURS: 80

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 tests. The material to be covered is listed below.

III. 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
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	40 HOURS

Technical Option:

7. Units of Measurement	10 hours
8. Geometry	15 hours
9. Trigonometry	10 hours
10. Statistics	5 hours
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	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
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	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
<p>GEOMETRY (Technical Option)</p> <p>Angles and Polygons Quadrilaterals Triangles Similar Triangles Circles Radian Measure Prisms Cylinders Pyramids and Cones Spheres</p> <p>Right Angles and Pythagorean Theorem Basic Geometric Figures Perimeter Area-Rectangles and Squares Area-Parallelograms, Triangles and Trapezoids Circles Volume and Surface Area Similar Triangles</p>	<p>Ewen Ewen Ewen Ewen Ewen Ewen Ewen Ewen Ewen Ewen</p> <p>Keedy Keedy Keedy Keedy Keedy Keedy Keedy Keedy</p>	<p>Ex. 13.1 pages 363-371 Ex. 13.2 pages 371-376 Ex. 13.3 pages 376-387 Ex. 13.4 pages 387-391 Ex. 13.5 pages 392-400 Ex. 13.6 pages 400-405 Ex. 13.7 pages 405-409 Ex. 13.8 pages 409-414 Ex. 13.9 pages 415-421 Ex. 13.9 pages 422-424</p> <p>Appendix C Ex. 7.1 pages 401-410 Ex. 7.2 pages 411-414 Ex. 7.3 pages 415-418 Ex. 7.4 pages 419-424 Ex. 7.5 pages 425-432 Ex. 7.6 pages 433-440 Ex. 7.9 pages 461-466</p>
<p>TRIGONOMETRY (Technical Option)</p> <p>Trigonometric Ratios Using Trigonometric Ratios to Find Angles Using Trigonometric Ratios to Find Sides Solving Right Triangles Solving Oblique Triangles: Law of Sines Solving Oblique Triangles: Law of Cosines</p> <p>Angles and Rotation Trigonometric Functions Trigonometric Functions and Right Triangles Solving Right Triangles and Applications Law of Sines Law of Cosines</p>	<p>Ewen Ewen Ewen Ewen Ewen Ewen</p> <p>Keedy Keedy Keedy Keedy Keedy Keedy</p>	<p>Ex. 14.1 Pages 429-434 Ex.14.2 Pages 434-437 Ex.14.3 Pages 437-439 Ex. 14.4 Pages 439-442 Ex.14.8 Pages 459-463 Ex.14.10 Pages 469-474</p> <p>Ex. 12.1* Pages 2-6 Ex. 12.2* Pages 7-12 Ex. 12.3* Pages 13-18 Ex. 12.4* Pages 19-24 Ex. 12.5* Pages 25-28 Ex. 12.6* Pages 29-32</p> <p>* from the fourth edition available as a supplement to the sixth edition</p>

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)	
Trade Discounts	Ex. 5.1 Pages 149-160
Cash Discounts	Ex. 5.2 Pages 161-168
Inventory Valuation	Ex. 5.3 Pages 169-178
Markup	Ex. 5.4 Pages 179-191
Markdown and Tax	Ex. 5.5 Pages 193-198
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:

MAJOR ASSIGNMENTS AND TESTS

While regular tests will normally be scheduled and announced beforehand, there may be an unannounced test on current work at any time. Such tests, at the discretion of the instructor, may be used for up to 30% of the overall mark.

At the discretion of the instructor, there may be a mid-term exam and there may be a final exam, each of which can contribute up to 30% of the overall mark.

The instructor will provide you with a list of test dates. Tests may be scheduled out of regular class time.

ATTENDANCE

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

If you are absent from class, it is your responsibility to find out from your instructor what work was covered and assigned and to complete this work before the next class. Your absence indicates your acceptance of this responsibility.

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. EVALUATION PROCESS/GRADING SYSTEM (Continued):**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	(55% - 69%)
X or R	A temporary grade, limited to situations with extenuating circumstances, giving a student additional time to complete course requirements (See below)	(45% - 54%)
R	Repeat - The student has not achieved the objectives of the course, and the course must be repeated	(0% - 44%)
CR	Credit exemption	

The method of calculating your weighted average will be defined by your instructor. Since grades are based upon averages, it follows that good marks in some tests can compensate for a failing mark in another test.

Make-Up Test (if applicable)

An "X" grade may be assigned at the end of the regular semester if you have met **ALL** of the following criteria:

- an overall average between 45% and 54% was achieved
- at least 50% of the tests were passed
- at least 80% of the scheduled classes were attended
- all of the topic tests were written

If you are assigned an "X" grade, you may convert it to a "C" grade by writing a make-up test on topics agreed to by the instructor. This test will be available at the time agreed to by your instructor.

At the end of the regular term, it is your responsibility to obtain your results from your instructor and, in the event of an "X" grade, to inquire when the make-up test will be available.

The score you receive on this make-up test will replace your original test score and be used to re-calculate your weighted average. If the re-calculated average is 55% or greater, a "C" grade will be assigned. If the re-calculated average is 54% or less, an "R" grade will be assigned.

VI. EVALUATION PROCESS/GRADING SYSTEM (Continued):**"R" and "X" Grades at the end of the Semester**

If an "X" grade is not cleared by the specified date, it will become an "R" grade. Except for extenuating circumstances, an "X" grade in Math will not be carried into the next semester.

"R" Grades during the Semester

A student with a failing grade and poor attendance (less than 80% attendance) may be given an "R" at any time during the semester.

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.

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).