SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. KARIE, ONTARIO

COURSE OUTLINE

MATHEMATICS

COURSE TITLE

MTH 254-4   III

CODE NO   SEMESTER

ARCHITECTURAL/COMPUTER ENGINEERING, CIVIL, ELECTRICAL,
ELECTRONIC, AND MECHANICAL TECHNICIANS

PROGRAM;

W. MACQUARRIE

AUTHOR:

JULY 1992   AUGUST 1991

DATE: PREVIOUS OUTLINE DATED

APPROVED: _____ ____/ ^ **^/"f**
                DEAfT   ^   DATE   ^

TOTAL CREDIT HOURS: 64

PREREQUISITE(S): MTH128-4, MTH220-5 or MTH426-4

I, PHILOSOPHY/GOALS:

When the student has successfully completed this course, he will have
demonstrated an acceptable ability to pass tests based upon the course
topics as listed elsewhere. If, after completing the course, the student
takes further courses (or employment) in which he is required to apply this
material, he/she should then, through practice be able to develop a good
command in this subject matter.

II.   STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will:

1. Use special products, factoring, lowest common multiple procedures to
    manipulate technical scientific formulae.   ^

2. Be able to solve quadratic and simultaneous equations.

3. Calculate distances, areas and volumes on/of solid figures and
    calculate various weights and costs of composite shapes.

4. Understand and use algebra techniques and graphs to study straight
    lines and the conic sections.

5. Use analytic geometry and various algebraic processes to find a linear
    or non-linear empirical equation from laboratory raw data.

The basic objectives are that the student 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 on the following page.

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III. TOPICS TO BE COVERED   **TIME FRAME**

Algebra review including special
products, factoring, lowest common
multiple, exponents, formula
manipulation, quadratic and systems
of equations   9 hrs.

Solid Mensuration   16 hrs

3. Analytic Geometry of straight
   lines and conic sections   16 hrs.

4. Linear and non-linear
   empirical equations   7 hrs.

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IV, LEARNING ACTIVITIES   REQUIRED RESOURCES

TOPIC NO	PERIODS	DESCRIPTION

ESSENTIALS OF MATHEMATICS
PERSON, 5TH EDITION

(1)   ALGEBRA REVIEW
                         -special products,   Ch.13 Pgs. 209-233, Ex.
                         factoring   13.1,13.2,13.3,13.4,13.5,
                                                    13.6,13.7,13.10,13.11,
                                                    13.12,13.13,13.16

                         -lowest common multiple   Pgs. 30-32 , 248, Ex. 2.4
                                                     Handout
                         -exponents   Pgs." 7 5,76 , 141-143, 150-
                                                     159, 331-349, Ex. 10.1,
                                                     18.1, 18.2 , 18.3
                         -formula re-arrangement   Ch.11 and 15, Pgs. 173-
                                                     186, 259-276, Ex. 11.3,
                                                     15.4, 15.5 , 15.7
                         -quadratic equations   Ch.20, Pgs . 376-392, Ex.
                         (complete the square)   20.2,20.3(Emphasize),20.4
                         -simultaneous equations   Ch.17, Pgs . 319-323, Ch.
                                                     16, Pgs. 284-300, Ex.
                                                     17.2,17.3,16.1,16.2,16.3 *M*
                                                     (Emphasize), 16.5   ^

(2)   16   SOLID MENSURATION   Review Chapters 26 to 33
                 -composite distances   Misc. problems from each
                 -composite areas   exercise. Handout sheets
                 -composite volumes,weights   of composite problems by
                 -cost estimates   the professor.

(3)   16   ANALYTIC GEOMETRY
                 -points & straight lines   *CK*. 17, Pgs. 314-318,
                 -conic sections - circle   326-330
                 parabola, ellipse, axis   Ch. 23, Pgs. 448-460
                 translation   Handout sheets - college
                 -general 2nd, degree   manuscript problems
                 equation
                 -graphs properties and
                 equations of each

(4)   7   EMPIRICAL EQUATIONS   RICE & KNIGHT 2nd
                 -linear empirical   edition, Ch. 6
                 equations; two pt. method,
                 method of averages, method   Handout sheets provided
                 of least squares
                 (optional)
                 -non-linear equations;
                 general polynomial
                 function, power functions
                 (3-methods)

Computer Eng., Electrical, Electronic)
(Civil, & Mechanical Technicians)

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IV. LEARNING ACTIVITIES: **REQUIRED RESOURCES**

TOPIC NO.   PERIODS   DESCRIPTION

Text: Basic Technical
Mathematics with Calculus
- A.J. Washington

(1   ALGEBRA REVIEW
                      -special products/   Pages 14 9-16 2, Ch. 5, Ex.
                      factoring   5.1,5.2,5.3, Pg.31-34,
                                                   Ch.l, Ex. 1.9
                      -lowest common multiple   Ex. Handout Sheet
                      (L.CM.)
                      -exponents   Ch.l Pgs. 14-20, Ex. 1.5
                                                   Ch.lO, Pgs.288-298, Ex.
                                                   10.1,10.2,
                                                   Ch.l Pgs.
                                                   38-44,Ex.1.11,1.12
                      -formula re-arrangement   Ch.5 Pgs. 177-184, Ex.5.7
                      -quadratic equations   Ch.6 Pgs. 190-193, Ex.6.2
                      (complete the square)   Ch.4 Pgs. 116-126,
                      -simultaneous equations   Ex.4.3, 4.4, Pgs. 133-
                                                   137 Ex.4.6

(2)   16   SOLID MENSURATION   Appendix "C"
                      -composite distances   Pgs. A-18 to A-25
                      -composite areas   Hand out sheets of
                      -composite volumes,weights   composite probes by the
                      -cost estimates   professor.

(3)   16   ANALYTIC GEOMETRY
                      -points & straight lines   Ch.2 Pgs. 54-64, Ex.
                                                   2.3,2.4, Pgs. 109-116 Ex.
                                                   4.2
                      -conic sections - circle,   Ch.20 Pgs. 558-586 & 593-
                      parabola, ellipse, axis   600 Ex. 20.1, 20.2, 20.3,
                      translation   20.4, 20.5, 20.7, 20.8
                      -general 2nd degree
                      equation
                      -graphs, properties &
                      equations of each

(4   EMPIRICAL EQUATIONS   Rice & Knight 2nd Edition
                      -linear empirical   Ch. 6 Pgs. 334-341
                      equations, -2 pt.method,   Teacher provided handout
                      method of averages,   sheets.
                      method of least squares
                      (optional)
                      -non-linear empirical   Ch.14, Pgs. 334-341
                      equations, general   Teacher provided handout
                      polynomial function, power   sheets.
                      function (3 methods)

V- EVALUATION METHODS:

The students will be assessed by written tests, including major periodic tests based upon large blocks of the subject matter and some unannounced short quizzes on current work, the latter being given at the discretion of the instructor. A final test on the whole course may also be included. A letter grade will be based upon a student's average of all his test results. See also the mathematics department's annual publication "MATHEMATICS DEPARTMENT EVALUATION GUIDELINES" for further details. This publication is made available to the students early in each academic year.

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GRADING:            A+ = 90 - 100%
                    A  - 80 -  89%
                    B  = 55 -  79%
                    C  = 55 -  64%
                    I, X or R = less than 55%
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VI. REQUIRED STUDENT RESOURCES:

Person, R., "Essentials of Mathematics", {5th Edition), Wiley Publ. **OR**

Washington, "Basic Technical Mathematics with Calculus", 5th edition,   ^
Benjamin Cummings (Metric Version).

VII. SPECIAL NOTES:

Students with special needs (e.g. physical limitations, visual impairments, hearing impatirments, 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 needs of students.

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