SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE   MATHEMATICS

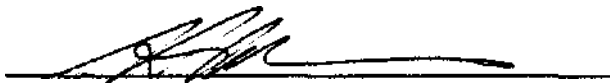**CODE NO.:**   MTH551-4   **SEMESTER:**   III

PROGRAM: MECHANICAL/ELECTRICAL/ELECTRONICS/COKPUTER TECHNOLOGY

AUTHOR: JOHN REAL

DATE   AUGUST 1991   **PREVIOUS OUTLINE DATED**   JUNE 1989

APPROVED: _____   DATE ^   ^/P^.
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COURSE NAHE   **COURSE NUMBER**

TOTAL CREDIT HOURS: 48

PREREQUISITE(S): MTH426

I. **PHILOSOPHY/GOALS:**

This introductory course in calculus contains a topic on analytic
geometry of the straight line and conic sections, the derivative of
algebraic functions and some traditional applications, followed by an
introduction to integration of algebraic functions.

II. **STUDENT PERFORMANCE OBJECTIVES:**

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 below.

III. **TOPICS TO BE COVERED:**

1. Plan Analytic Geometry-

2, The Derivative.

3, Applications of the Derivative.

4. Integration.

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IV. LEARNING ACTIVITIES: **REQUIRED RESOURCES**

1.0 <u>Plane Analytic Geometry</u>   Chapter 20

1.1 Basic definitions.   Questions 1 - 48, p. 563

1.2 The straight line.   Questions 1 - 52, p. 569

1.3 The circle.   Questions 1 - 44, p. 574

1.4 The parabola.   Questions 1 - 36, p. 579

1.5 The ellipse.   Questions 1 - 36, p. 585

1.6 The hyperbola.   Questions 1 - 36, p. 592

1.7 Translation of axes.   Questions 1 - 31, p. 596

1.8 The second degree equation. Questions 1 - 26, p. 600

1.9 Review exercise.   Questions 1 - 24, p. 609
                                            41 - 76,

2.0 <u>The Derivative</u>   Chapter 22

2.1 Limits-   Questions 1 - 44, p. 649

2.2 The slope of a tangent to a Questions 1 - 24, p. 655
     curve.

2.3 The derivative.   Questions 1 - 32, p. 660

2.4 The meaning of the   Questions 1 - 32, p. 664
     derivative.

2.5 Derivatives of polynomials. Questions 1 - 44, p. *669*

2.6 Derivatives of products and Questions 1 - 44, p. 674
     quotients of functions.

2.7 The derivative of a power of Questions 1 - 44, p. 680
     a function.

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IV. LEARNING ACTIVITIES: (cont'd)   **REQUIRED RESOURCES**

2.8   Differentiation of implicit.   Questions 1 - 32, p. 684

2.9   Higher derivatives.   Questions 1 - 36, p. 688

2.10 Review exercise   Questions 1 - 68, p. 689

3.0   Applications of the   Chapter 23
      Derivative

3.1   Tangents and normals.   Questions 1   24, p. 696

3.2   Curvilinear motion.   Questions 1   24, p. 705

3.3   Related rates.   Questions 1   24, p. 709

3.4   Using derivatives in curve   Questions 1   32, p. 716
      sketching.

3.5   More on curves-   Questions 1 - 18, p. 720

3.6   Applied maximum and minimum   Questions 1 - 32, p. 727
      problems.

3.7   Review exercise,   Questions 1   48, p. 728

4.0   Integration   Chapter 24

4.1   Differentials.   Questions 1   32, p. 735

4.2   Antiderivatives.   Questions 1   32, p. 738

4.3   The indefinite integral.   Questions 1   44, p. 744

4.4   The area under a curve.   Questions 1   16, p. 750

4.5   The definite integral.   Questions 1   36, p. 753

4.6   Review exercise.   Questions 1   36, p. 761
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V. METHOD OF EVALUATION:

1. Three - four tests per semester.

2. Final grade is a weighted average of these tests.

                    90 - 100 ≈ A+
                    80 - 89 ^ A
                    65 - 79 ≈ B
                    55 - 64 » C
                     0 _ 54 » R (:or X)

Under special circumstances an X grade may be assigned to allow the
student to continue with the next math, course (Technician or
Technology level). If unsuccessful with this next course, both courses
would have to be repeated.

All tests are scheduled in advance. Hence, attendance is mandatery.
Unexcused absence from a test will result is a mark of zero for that
test. If a student is prevented from writing a test by illness, the   ^
instructor should be notified before the time of the test. Upon return   ^
to class, the student should see the instructor immediately to arrange
a time for a make-up test. The student should have a note from the
college nurse or a doctor.

VI. REQUIRED STUDENT RESOURCES:

Washington, <u>Basic Technical Mathematics With Calculus</u>, fifth edition,
metric version. Benjamin/Cummings Pub. Co, 1990

VII. 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 needs of students.

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