SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE:	CALCULUS
CODE NO,:	MTH577-4　　　　　　　**SEMESTER;**
PROGRAM:	ELECTRICAL/ELECTRONIC/COMPUTER TECHNOLOGY
AUTHOR:	JOHN REAL
DATE:	JULY 1993　　　　**PREVIOUS OUTLINE DATED**　　　JULY 1992
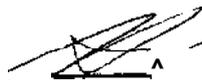
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TOTAL CREDIT HOURS: 64

PREREQUISITE(S): MTH551

I. PHILOSOPHY/GOALS:

This course deals with integration of algebraic functions, applications
of simple integration, velocity, acceleration, areas, volumes,
differentiation and integration of transcendental functions, and
methods of integration, including some applications to
electrical/electronics data.

II. STUDENT PERFORMANCE OBJECTIVES:

The basic objectives are that the student develop an understanding of
the methods studied, knowledge of the facts presented, and an ability
to use these in the solution of problems. To accomplish these
objectives, exercises are assigned. Tests questions will be of near   *M*
equal difficulty to questions assigned from 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:

IV, TOPICS TO BE COVERED:	TIME FRAME:
1. Applications of Integration	14 periods
2. Differentiation of Transcendental Functions	25 periods
3. Methods of Integration	25 periods

III. TERMINAL PERFORMANCE OBJECTIVES - MTH577

After studying each of the following topics, the student should be able to:

TOPIC 1:

1.   Solve problems involving distance-velocity-acceleration, current-voltage-charge using integration.

2.   Find areas (between two curves) using horizontal and vertical elements and definite integrals.

3.   Find the volume of a solid of revolution using the disk or shell method.

TOPIC 2:

1.   Find derivatives of expressions containing sine or cosine functions.

2.   Find derivatives of other trigonometric functions.

3.   Find derivatives of inverse trigonometric functions.

4.   Solve worded problems which involve trigonometric functions.

5.   Find derivatives of logarithmic functions - any constant base.

6.   Find derivatives of exponential functions - any constant base.

7.   Solve worded problems involving logarithmic of exponential functions.

TOPIC 3:

1.   Integrate any type of algebraic or transcendental function using the general power formula for integration.

2.   Find integrals of expressions leading to a natural logarithm form

3.   Evaluate integrals of exponential expressions.

4.   Evaluate integrals of trigonometric functions (using rules for derivatives or trigonometric functions).

5.   Find integrals of other trigonometric functions requiring the use of trigonometric identities.

6.   Find integrals of algebraic functions leading to inverse trigonometric functions (using rules for derivatives of inverse trigonometric functions.

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rV. LEARNING ACTIVITIES:

1.0	<u>Applications of Integration</u>	Chapter 25
1.1	Applications of the indefinite integral	Questions 1-20, 23, p.769
1.2	Areas by integration	Questions 1-27, p.775
1.3	Volumes by integration	Questions 1-26, p.782
1.4	Review Exercise	Questions 1-22, p.802
2.0	<u>Dif,ferentiation of Transcendental Functions</u>	Ch. 26
2.1	Derivatives of sine and cosines functions	Questions 1-50, p.809
2.2	Derivatives of other trig, functions	Questions 1-46, p.813
2.3	Derivatives of inverse trigonometric functions	Questions 1-41, p.817
2.4	Applications	Questions 1-8, 11-16, p.821
2.5	Derivatives of logarithmic functions	Questions 1-48, p.826
2.6	Derivatives of exponential functions	Questions 1-48, p.82 9
2.7	Applications	Questions 1-32, p.833
2.8	Review	Questions 1-50, p.835

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V. LEARNING ACTIVITIES: (cont'd)

3.0 <u>Methods of Integration</u>   Chapter 27

3.1 The general power formula   Questions 1 - 24 p. 843

3.2 The basic logarithmic form   Questions 1 - 28, p. 846

3.3 The exponential form   Questions 1 - 24, p. 850

3.4 Basic trigonometric forms   Questions 1 - 24, p. 853

3.5 Other trigonometric forms   Questions 1 - 28, p. 858

3.6 Inverse trigonometric forms   Questions 1 - 28, p. 862

3.7 Review   Questions 1 - 36, p. 874

VI- 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. If unsuccessful with
this next course, both courses would have to be repeated.

All tests are scheduled in advance. Hence, attendance is mandatory.
Unexcused absence from a test will result in 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.

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VII. REQUIRED STUDENT RESOURCES:

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

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 needs of students.

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