SAXILT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE   CALCULUS

CODE NO,:   MTH367-4   V
                                 SEMESTER

PROGRAM: ELECTRICAL/ELECTRONICS/COMPUTER TECHNOLOGY

AUTHOR: JOHN REAL

DATE: JULY 1992   AUGUST 19 91
                        PREVIOUS OUTLINE DATED:

APPROVED:
          DEAN^.-^   ^

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TOTAL CREDIT HOURS: 64

PREREQUISITE(S): MTH577 OR MTH578

I. PHILOSOPHY/GOALS:

This advanced course in calculus contains some special methods of
integration, Maclaurin, Taylor and Fourier series, various types of
first and second order differential equations, Laplace transform
methods of solution, and applications to the electrical/electronics
area.

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: **TIME FRAME:**

1. Methods of Integration.   16 periods

2. Expansion of Functions in Series   18 periods

3. Differential Equations.   2 6 periods

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IV. LEARNING ACTIVITIES: REQUIRED RESOURCES

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

1.1 The general power formula.   Questions 1 - 24, p.843
     (review)

1.2 Integration by use of   Questions 1 - 32, p.872
     tables.

1.3 The basic logarithmic form,   Questions 1 - 28, p.846
     (review)

1.4 The exponential form,   Questions 1 - 2 4 , p.850
     (review)

1.5 Basic trigonometric forms.   Questions 1 - 2 4 , p.853
     (review)

1.6 Other trigonometric forms.   Questions 1 - 28, p.858
     (review)

1.7 Inverse trigonometric forms.   Questions 1 - 28, p.862
     (review)

1.8 Integration by parts,   Questions 1 - 15, p.866

1.9 Integration by trigonometric
     substitution.   Questions 1 - 16, p.870

1.10 Integration by partial   Questions 1   12., p. 992
     fractions.   1   12, p. 997

1,11 Review exercise.   Questions 1 - 36, p. 874

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

2.0   Expansion of Functions in   Chapter 28
      Series

2.1   Infinite series.   Questions 1 - 28, p.880

2.2   Maclaurin series.   Questions 1-30, p.887

2.3   Certain operations with   Questions 1 - 26, p.891
      series.

2.4   Computations by use of   Questions 1 - 26, p.894
      series expansions.

2.5   Taylor's series,   Questions 1 - 28, p.898

2.6   Fourier series.   Questions 1 - 12, p.905

2.7   Review exercise.   Questions 1-42, p. 907

3.0   First Order Differential   Chapter 29
      Equations

3.1   Solutions of differential   Questions 1 - 28, p.912
      equations.

3.2   Separation of variables.   Questions 1   32, p.917

3.3   Integrable combinations.   Questions 1   33, p.919

3.4   Linear first order DE.   Questions 1   32, p.922

3.5   Elementary applications.   Questions 1   40, p. 927
                                   Handout

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4.0 Higher Order Differential   Chapter 2 9
     Equations

4.1 Homogeneous equations with   Questions 1 - 28, p.933
     constant coefficients.

4.2 Auxiliary equations with   Questions 1 - 32, p.937
     repeated or complex roots.

4 . 3 Solutions of nonhomogeneous Questions 1 - 28, p.942
     equations.

4 .4 Applications of second-order Questions 11 - 20, p.948
     differential equations.   Hand-out

4.5 Laplace transforms.   Questions 1 - 24, p.953

4.6 Solving differential   Questions 1 - 16, p.956
     equations.

4.7 Review exercise.   Questions 1 - 72, p.957

V. METHOD OF EVALUATION:

1. Three - four tests per semester,

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

$$
\begin{array}{rcl}
85 - 100 &=& A+ \\
75 - 84 &=& A \\
65 - 74 &=& B \\
55 - 64 &=& C \\
0 - 54 &=& R \ (;\text{or } X)
\end{array}
$$

All tests are scheduled in advance. Hence, attendance is mandatory.
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.

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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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