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CALCULUS

MTH367-4

**COURSE NAME****COURSE NUMBER****TOTAL CREDIT HOURS: 6 4****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:**

1. Methods of Integration.
2. Expansion of Functions in Series
3. Differential Equations.

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<b>IV. LEARNING ACTIVITIES:</b>	<b>REQUIRED RESOURCES</b>
1.0 <u>Methods of Integration</u>	Chapter 27
1.1 The general power formula.	Questions 1 - 24, p.835
1.2 Integration by use of tables.	Questions 1 - 32 p.864
1.3 The basic logarithmic form, (using tables)	Questions 1 - 24 p.838
1.4 The exponential form, (using tables)	Questions 1 - 24 p.842
1.5 Basic trigonometric forms. (using tables)	Questions 1 - 24 p.846
1.6 Other trigonometric forms, (using tables)	Questions 1 - 28 p.851
1.7 Inverse trigonometric forms. (using tables)	Questions 1 - 28 p.855
1.8 Integration by parts, (using tables)	Questions 1 - 16 p.858
1.9 Integration by trigonometric substitution, (using tables)	Questions 1 - 16 p.862
1.10 Review exercise, (using tables)	Questions 1 - 36 p.865
2.0 <u>Expansion of Functions in Series</u>	Chapter 28
2.1 Maclaurin series.	Questions 1 - 28, p.872
2.2 Certain operations with series.	Questions 1 - 20, p.878
2.3 Computations by use of series expansions.	Questions 1 - 20, p.881
2.4 Taylor's series.	Questions 1 - 24, p.885
2.5 Fourier series.	Questions 1 - 12, p.893
2.6 Review exercise.	Questions 1 - 40, p.894

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<b>IV. LEARNING ACTIVITIES: (cont'd)</b>	<b>REQUIRED RESOURCES</b>
3.0 <u>First Order Differential Equations</u>	Chapter 29
3.1 Solutions of differential equations.	Questions 1 - 24, p.898
3.2 Separation of variables.	Questions 1 30, p.902
3.3 Integrable combinations.	Questions 1 30, p.908
3.4 Elementary applications.	Questions 1 36, p.913 Hand-out
4.0 <u>Higher Order Differential Equations</u>	Chapter 29
4.1 Homogeneous equations with constant coefficients.	Questions 1 - 27, p.920
4.2 Auxiliary equations with repeated or complex roots,	Questions 1 - 31, p,924
4.3 Solutions of nonhomogeneous equations-	Questions 1 - 28, p,928
4.4 Applications of second-order differential equations.	Questions 1 - 8, p.932 Hand-out
4.5 Laplace transforms.	Questions 1 - 24, p,938
4.6 Solving differential equations.	Questions 1 - 16, p.941
4.7 Review exercise	Questions 1 - 36, p.942

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**COURSE NAME****COURSE NUMBER****V. METHOD OF EVALUATION:**

1. Three - four tests per semester.
2. Final grade is a weighted average of these tests.

85 - 100 - A+

75 - 84 = A

65 - 74 = B

55 - 64 - C

0 - 54 » R (or X)

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.

**VI- REQUIRED STUDENT RESOURCES:**

Washington, Basic Technical Mathematics With Calculus, fourth edition, metric version. Benjamin/Cummings Pub. Co. 1985

**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.