

TECHNICAL MATHEMATICS

MTH654-4

COURSE NAME

COURSE NUMBER

TOTAL CREDIT HOURS: 64

PREREQUISITE(S): MTH626-4

SUBSTITUTE(S): None

I. PHILOSOPHY/GOALS:

1. Review the analytic geometry of the straight line and conic sections.
2. Study various methods of finding empirical equations from raw lab data.
3. Study methods of integration.
4. Study first and second order differential equations.

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will be able to:

1. Layout graphs and find the general equations of various straight lines, circles, parabolas, ellipses and hyperbolas.
2. Find the empirical equations for any set of raw lab data by various methods, 2 pt method, method of averages for linear relationships, method of selected points on general polynomials.
3. Differentiate and integrate various trig, log exponential and other functions.
4. First and second order differential equations.

III. TOPICS TO BE COVERED:

TIME ALLOTTED

- | | |
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| 1. Analytic Geometry. | 6 |
| 2. Empirical Equations. | 11 |
| 3. Methods of Integrating Trig, Log Exp. Functions, etc. | 24 |
| 4. Differential Equations | 23 |

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MTH654^

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IV. LEARNING ACTIVITIES:

REQUIRED RESOURCES:

Topic

No. PERIODS DESCRIPTION

1 ANALYTIC GEOMETRY -
 Properties, formulae and applications of the straight line, arcle. parabola ellipse, and hyperbola.

Washington Text - Chapter 21
 Pages 536-583
 Problems from:
 Exercise 21.1
 Exercise 21.2
 Exercise 21-3
 Exercise 21-4
 Exercise 21-5
 Exercise 21-6
 Exercise 21-7

11 EMPIRICAL EQUATIONS -
 -Linear empirical equations
 Two point method and method of averages
 -Non-linear empirical equations
 (1) General pol)aioniial function-method of selected pts
 (2) Power function
 -2-pt method
 -Method of averaging logs
 -Graphical method

Review Exercise p. 580-582
 Handout Notes - Teacher Assigned Problems. Assignments

24 METHODS OF INTEGRATION-
 -Power Formula
 -Basic logarithmic form
 -Exponential form
 -Various trigonometric forms

 •Integration by parts

 •Integration by trigonometric substitutions

 -Integration by use of tables

Washington, Chapter 28
 Exercise 28-1 p.7%
 Exercise 28-2 p.800
 Exercise 28-3 p.803
 Exercise 28-4 p.806
 Exercise 28-5 p.810
 Exercise 28-6 p.814
 Exercise 28-7p.818

 Exercise 28-8 p.821

 Exercise 28-9p.823

 Review Exercises

TECHMICAL MATHEMATICS

MTH6544

COURSE NAME

COURSE NUMBER

IV. LEARNING ACTIVITIES: (cont'd)

REQUIRED RESOURCES:

Topic

No. PERIODS DESCRIPTION

DIFFERENTIAL EQUATIONS

Washington. Chapter 30

-Solutions of ODEs Exercise 30-1 p.859
-Separation of variable Exercise 30-2 p.863
-Integrable combination Exercise 30-3 p.865
-Linear ODEs of 1st order Exercise 30-4 p.868
-Elementary applications Exercise 30-5 p.872
-2nd order homogeneous ODEs Exercise 30-6 p.878

-Auxilliary equation with
repeated roots Exercise 30-7 p.881

-Solutions of non homogeneous
equations Exercise 30-8 p.885

-Applications of 2nd order ODEs Exercise 30-9 p.891

V. METHOD OF EVALUATION:

The student will be assessed by written tests, including up to five major periodic announced tests based on large blocks of subject matter, and several unannounced short quizzes on current work, the latter being given at the discretion of the instructor. Up to two assignments on empirical equations and/or aircraft graphs may be included in the course. A final test on the entire course may also be included, counting up to 30% of the final semester grade. A letter grade will be determined based upon an average of the above.

GRADING:

A+ = 90 - 100%

A = 80 - 89%

B = 65 - 79%

C = 55 - 64%

I, X or R = less than 55%**

** See also the "MATH DEPT. EVALUATION GUIDELINES" publication for complete procedures and policies.

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VI. REQUIRED STUDENT RESOURCES:

L Basic Technical Calculus with Analytic Geometry: A.J. Washington, 6th edition - Benjamin Cummings.

2. Calculator: (Recommended) SHARP Scientific Calculator EL-531G. The use of some kinds of calculators may be restricted during tests.

VII. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY BOOK SECTION:

None available.

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.

