ENT 333       Computational Methods for Engineering Technology                             3

Course Number                               Title                                  Credit hours

DESCRIPTION:
An in-depth study of engineering analysis techniques with emphasis on mathematical analysis of
mechanical and electrical subsystems. Detailed study of a variety of situations using techniques
based on state-variable analysis and state-transition matrix; convolution and circuit response in the
time domain; system function and response in the frequency domain; and time shift and periodic
functions.

PREREQUISITES:  MTH 251: Calculus-II

ISBN: 978-0-470-08484-7 Hardcover May 2006 US $162.95 Publisher: WILEY

COURSE COORDINATOR: Associate Professor, Dr. Mysore Narayanan

COURSE OBJECTIVES:
Upon completion of this course, the student should be able to:
• Have strong knowledge about linear algebra, Taylor series, Laplace Transforms and differential
equations.

COURSE OUTCOMES:
  1. Perform Matrix operations.
  2. Solve a variety of differential equations.
  3. Appreciate the need for eigenvalues and eigenvectors.
  5. Utilize techniques of Laplace Transforms.

TOPICAL OUTLINE:
Week # 1 : Complex Numbers, Partial Fractions, Determinants, Taylor series.
Week # 2 : Vectors, Scalar Products and Vector Products. Gram-Schmidt Orthogonalization.
Week # 3: Chapter # 3: Linear Equations. Inverse and Derivative of Matrices. Exam. # 1
Week # 4: Eigenvalues and Eigenvectors. Diagonalization of Matrices. The Matrix Exponential.
Week # 5: Separable, Exact and Homogeneous Equations. Bernoulli and Riccati Equations.
Week # 9: Convergence. Frequency and Amplitude Spectra. Double Fourier Series. Exam. # 2
Week # 12: Vector Integral Calculus. Transport Theorems. Exam. # 3
Week # 14: Conformal Mapping. Boundary Value Problems.
Week # 15: Final Exam. Comprehensive.

METHOD OF EVALUATION:
The student will be evaluated on homework, class participation, performance on quizzes, a final examination, and written laboratory reports.

Tests 45%
Homework and class participation 15%
Labs 20%
Final exam 20%

METHOD OF EVALUATION:
ENT Department Standard for awarding letter grades: Each faculty member will use the following scale in assigning letter grades in their courses, with the following allowances:
• the end (or ends) of any range can be adjusted by 1 point (+/-)
• the assignment of the D- or F may deviate by a few points (2-3) from the values shown
• faculty may elect to not use +/- grades

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Miami University Learning Community
Miami University is committed to fostering a supportive learning environment for all students irrespective of individual differences in gender, race, national origin, religion, handicapping condition, sexual preference, or age. Students should expect, and help create, a learning environment free from all forms of prejudice. Disparaging comments, sexist or racist humor, or questioning the academic commitment of students based upon these individual differences are behaviors that undermine our learning community. If such behaviors occur in class, please seek the assistance of your instructor or department chair.

Narayanan/Speckert June 2013