

King Fahd University of Petroleum and Minerals
Department of Mathematical Sciences
SYLLABUS 062

Prepared by: Dr. F. D. Zaman

Course: Math 302
 Title: Engineering Mathematics
 Textbook: Advanced Engineering Mathematics by P. O'Neil, 5th edition (2003).
 Objectives: This course is designed to expose electrical and other engineering students to some basic ideas in vector calculus, linear algebra and complex numbers.
 Catalogue Description: Vector analysis including vector fields, gradient, divergence, curl, line and surface integrals, Gauss' and Stokes' theorems. Introduction to complex variables, vector spaces and subspaces. Linear independence, basis and dimension, solution of linear equations, orthogonality, eigenvalues and eigenvectors.

Wk	Date	Sec.	Material	Homework
1	Feb. 17-21	5.4 5.5	The Vector Space \mathbb{R}^n Linear Dependence and Independence	4,7,13,15,18 5,15,17,22
2	Feb. 24-28	6.3 6.5 6.7	Row Echelon form of a Matrix Homogeneous Systems of Linear Equations Non-homogeneous Systems	6,10,19 2,9,11,19,20 8,14,17
3	Mar. 03-07	8.1 8.2	Eigenvalues and Eigenvectors Diagonalization	4,9,15,18,20 3,5,8,17
4	Mar. 10-14	8.3 11.1	Orthogonal and Symmetric Matrices Vector Functions of one Variable	2,5,10 5,9,13,16
5	Mar.17-21	11.4 11.5	The Gradient Field Divergence and Curl	7,11,16,21,27 6,9,12,16
First Major Exam. Tues. March 27, 2007				
6	Mar.24-28	12.1 12.2	Line Integrals Green's Theorem	5,13,22,27 1,7,12,14
7	Mar.31-Apr.4	12.3 12.4	Independence of Path and Potential Theory Surface Integrals	1,7,12,17,19 3,9,11,17
8	Apr. 07-11	12.7 12.8	Divergence Theorem of Gauss The integral theorem of Stokes	1,8,10,12,11,16 3,7,10,21
Mid Term Break April 12 - 15				
9	Apr. 16-18	20.1 20.2	Complex Number (Polar Form) Loci and Sets of Points in the plane	3,10,20,26,29 2,6,7,16,32,36
10	Apr. 21-25	21.1	Complex Functions, Limits and Continuity, Cauchy-Riemann Equations	2,3,4,5,10,16
Second Major Exam Wed. May 2, 2007				
11	Apr.28-May 2	21.2 21.3 21.4	Power Series The Exponential and Trig.Functions The Complex Logarithm	2,8,10 3,6,7,12,15,20, 21 2,5,6,8
12	May 5- 9	21.5 22.1 22.2	Powers Curves in the plane (Quick Review) Integration of Complex Function	2,5,9,16,19,26 2,3,4,9 1,5,9,14,18
13	May 12-16	22.3 22.4	The Cauchy Integral Theorem Consequences of Cauchy's Theorem	1,4,6,11,13 2, 5,9,17
14	May 19-23	23.2 24.1 24.2	Laurent Series (Definitions and Examples) Singularities The Residue Theorem	2,4,6,7,13 3,7,11,18,20 2,4,5,11,17,24,26
15	May 26-30 June 2	24.3.5	Evaluation of Real Integrals Review	28,32,35,44

KFUPM attendance policy will be enforced. Final Exam shall be comprehensive.

Office: 5-430, **Tel:** 860-2189, **E-mail:** fzaman@kfupm.edu.sa **webpage** <http://faculty.kfupm.edu.sa/math/fzaman/>

Grading Policy: Two Majors each 20%; Quizzes 10%; HW, Attend. 10%, Final 40% .