King Fahd University of Petroleum & Minerals

Department of Mathematics & Statistics

SYLLABUS (Math302, Term **133)**

Coordinator: Dr. Izhar Ahmad
Instructors: Dr. Bilal Chanane & Dr. Izhar Ahmad

Course: Math 302

Title: Engineering Mathematics

Textbook: Advanced Engineering Mathematics (Fifth Edition) by D.G. Zill and W.S. Wright, International Edition.

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 spaces and subspaces. Linear independence, basis and dimension, solution of linear equations, orthogonality, eigenvalues and eigenvectors. Vector calculus including vector fields, gradient, divergence, curl, line and surface integrals, Green's theorem, Gauss' and Stokes' theorems. Introduction to complex variables.

Grading Policy

1. **Major Exam I:** 25% (100 points) Thursday, June 26, 2014 at 7.00PM
   Material: 9.1,9.5,9.6,9.7,8.8, 9.9,9.12,9.13,9.14, 9.16
2. **Major Exam II:** 25% (100 points) Tuesday, July 15, 2014 at 9.00PM
   Material: 7.6,8.2,8.3,8.6,8.8,8.10, 8.12
3. **Final Exam:** 35% (140 points) Wednesday, August 13, 2014, 8.00AM
   Comprehensive

Class Work: 15% (60 points)

Attendance:

- Attendance is compulsory. KFUPM policy with respect to attendance will be strictly enforced.
- Any student accumulating **7 unexcused absences** will be awarded DN Grade in the course.

Date	Sec.	Material	Homework
June 8-12	9.1	Vector Functions	1,2, 15*,18*,33*,36*,41*
	9.5	Directional Derivatives	2,6*,8*,12*,14*
	9.6	Tangent Planes and Normal Lines	2, 6*, 16*, 34*, 38*
	9.7	Curl and Divergence	4,8*,10*,26*, 29, 30
	9.8	Line Integrals	4*,6,8*,14*,23*,30*,34*
June 15-19	9.9	Independence of Path	2*,4*,6,12*,15*,22*,25*
	9.12	Green's Theorem	1*,2*,4*,7,19*,20*, 29*
	9.13	Surface Integrals	1*, 2*,4, 6*,18*,20*
	9.14	Stokes' Theorem	1*,2*,4*,5,6*
	9.16	Divergence Theorem	1,2*,4*,6*,11*,13,14
June 22-26	7.6	Vector Spaces *(restricted to R^n only)*	1*, 2*, 3*, 22*, 23*,26*
	8.2	Systems of Linear Algebraic Equations	1*,6*, 10*, 12*
	8.3	Rank of a Matrix	4*, 8*, 10*, 14*
June 29-July 03	8.6	Inverse of a Matrix *(only using Theorem 8.6.4)*	1,2*,19*,25*,28*, 51,52*
	8.8	The Eigenvalue Problem	1,6*, 8*,20*
	8.10	Orthogonal Matrices *(excluding example 4)*	6*,8*,9*,16, 18*
	8.12	Diagonalization *(excluding example 6)*	1,2*,4,12*, 14*, 26*, 28
July 6-10	17.1	Complex Numbers	2*,4*,6, 18*, 30*, 34*,40
	17.2	Powers and Roots	6*,8*,12,16,33*,34*
	17.3	Sets in the Complex Plane	4*,5*,8*,23
	17.4	Functions of a Complex Variable	6*,8*, 10*,12*,14,21*,28,32*
	17.5	Cauchy-Riemann Equations	1*,2*,4*,5,6*,8,22*
July 13-17	17.6	Exponential and Log. Functions	2*,4,8*,13*, 28*,32*, 47*
	17.7	Trigonometric and Hyperbolic Functions	6,8*,10*, 16*
	18.1	Contour Integrals *(excluding Theorem 18.1.3)*	1,3,6*,7*,9*
	18.2	Cauchy-Goursat Theorem	2*,4*,5*,8,12,15*
Aug 3-7	18.4	Cauchy's Integral Formulas	3,4*,8*, 10*,14*,23
	19.2	Taylor Series *(Definition & Examples)*	2*,4*,6*,12
	19.3	Laurent Series *(Definition & Examples)*	2*,6*,10*,21*,25,26*,27*,28*
	19.4	Zeros and Poles	2*,4*,6*,8*,10*,14*,16*
Aug 10-12	19.5	Residues and Residue Theorem	1,2,8,10,22, 24
	19.6	Evaluation of Real Integrals	4,11,12,32

Only homework problems with * should be submitted for grading.