King Fahd University of Petroleum & Minerals

Department of Mathematics & Statistics

SYLLABUS (Math302, Term **131)**

Coordinator: Dr. Othman Echi
Instructors: Dr. Ahmad AL-Dweik, Dr. Othman Echi & Dr. Khairul Saleh

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

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

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Grading Policy: Two Majors 25% each; Quizzes 10%; HW and Attend. 5 %, Final 35%.

EXAMS:

1. **Major Exam I:** October 05, 2013 at 8:00 am
   Material: 7.6, 8.2, 8.3, 8.6, 8.8, 8.10, 8.12
2. **Major Exam II:** November 25,2013 at 08:00 pm
   Material: 9.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.12, 9.13, 9.14
3. **Final Exam:** Monday, January 6, 2014 at 7:00 PM

Lectures	Sec.	Material	Homework
1-2-3	7.6	Vector Spaces *(restricted to $\mathbb{R}^n$ only)*	1*, 2*, 3*, 22*, 23*,26*
4-5-6	8.2 8.3	Systems of Linear Algebraic Equations Rank of a Matrix	1*,6*, 10*, 12* 4*, 8*, 10*, 14*
7-8-9	8.6 8.8	Inverse of a Matrix *(only using Theorem 8.6.4)* The Eigenvalue Problem	1,2*,19*,25*,28*, 51,52* 1,6*, 8*,20*
10-11-12	8.10 8.12	Orthogonal Matrices *(excluding example 4)* Diagonalization *(excluding example 6)*	6*,8*,9*,16, 18* 1,2*,4,12*, 14*, 26*, 28
13-14-15	9.1 9.5 9.6	Vector Functions Directional Derivatives Tangent Planes and Normal Lines	1,2, 15*,18*,33*,36*,41* 2,6*,8*,12*,14* 2, 6*, 16*, 34*, 38*
16-17-18	9.7 9.8	Curl and Divergence Line Integrals	4,8*,10*,26*, 29, 30 4*,6,8*,14*,23*,30*,34*
19-20-21	9.9 9.12	Independence of Path Green's Theorem	2*,4*,6,12*,15*,22*,25* 1*,2*,4*,7,19*,20*, 29*
22-23-24	9.13 9.14	Surface Integrals Stokes' Theorem	1*, 2*,4, 6*,18*,20* 1*,2*,4*,5,6*
25-26-27	9.16 17.1	Divergence Theorem Complex Numbers	1,2*,4*,6*,11*,13,14 2*,4*,6, 18*, 30*, 34*,40
28-29-30	17.2 17.3 17.4	Powers and Roots Sets in the Complex Plane Functions of a Complex Variable	6*,8*,12,16,33*,34* 4*,5*,8*,23 6*,8*, 10*,12*,14,21*,28,32*
31-32-33	17.5 17.6	Cauchy-Riemann Equations Exponential and Log. Functions	1*,2*,4*,5,6*,8,22* 2*,4,8*,13*, 28*,32*, 47*
34-35-36	17.7 18.1	Trigonometric and Hyperbolic Functions Contour Integrals *(excluding Theorem 18.1.3)*	6,8*,10*, 16* 1,3,6*,7*,9*
37-38-39	18.2 18.4	Cauchy-Goursat Theorem Cauchy's Integral Formulas	2*,4*,5*,8,12,15* 3,4*,8*, 10*,14*,23
40-41-42	19.2 19.3 19.4	Taylor Series *(Definition & Examples)* Laurent Series *(Definition & Examples)* Zeros and Poles	2*,4*,6*,12 2*,6*,10*,21*,25,26*,27*,28* 2*,4*,6*,8*,10*,14*,16*
43-44-45	19.5 19.6	Residues and Residue Theorem Evaluation of Real Integrals	1,2,8,10,22, 24 4,11,12,32

Only homework problems with * should be submitted for grading.