King Fahd University of Petroleum & Minerals

Department of Mathematics and Statistics

MATH 302

Syllabus – Term 151

Coordinator: Dr. Ahmad Y. Al-Dweik

Course Code: 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) Wednesday, **October 14, 2015** at **7:00 PM**
   Material: **7.6 – 8.12**
2. **Major Exam II:** 25% (100 points) Wednesday, **November 11, 2015** at **5:30 PM**
   Material: **9.1 – 9.16**
3. **Class Work:** 15% (60 points) Quizzes + Homework + Attendances
4. **Final Exam:** 35% (140 points) Tuesday, **December 22, 2015** at **08:00 AM**
   Comprehensive

Attendance

- Attendance is compulsory. KFUPM policy regarding attendance will be strictly enforced.
- A **DN** grade will be awarded to any student who accumulates 9 unexcused absences.

Wk	Date	Sec.	Material	Homework
1	August 23 – 27	7.6	Vector Spaces *(restricted to $\mathbb{R}^n$ only)*	1*, 2*, 3*, 22*, 23*,26*
2	August 30 – September 3	8.2 8.3	Systems of Linear Algebraic Equations Rank of a Matrix	1*,6, 7*, 10*, 12* 4*, 8*,9*, 10, 14*
3	September 6-10	8.6 8.8	Inverse of a Matrix *(only using Theorem 8.6.4)* The Eigenvalue Problem	1*,2,19*,25*,28,30*, 51,52* 1*,6, 8*,16*,20
4	September 13-17	8.10 8.12	Orthogonal Matrices *(excluding example 4)* Diagonalization *(excluding example 6)*	5*,6,8*,9*,16, 18* 1,2*,4,12, 14*, 26, 28*
Id al-Adha Vacation: September 18 - 28, 2015				
5	September 29- October 1	9.1 9.5	Vector Functions Directional Derivatives	1*,2, 15*,18*,33*,36*,41* 2,6*,8*,12*,14,23*
6	October 4 – 8	9.6 9.7 9.8	Tangent Planes and Normal Lines Curl and Divergence Line Integrals	2, 6*, 16*, 34*, 38* 4,8*,10*,26*, 29, 30* 4*,6,8*,14*,23*,30*,34*
7	October 11 – 15	9.9 9.12	Independence of Path Green's Theorem	2*,4*,6,12*,15*,22*,25* 1*,2*,4*,7,19*,20*, 29*
Major Exam I: Wednesday, October 14, 2015 at 7:00 PM**, Loc.:** Bld-4-125**, Material:** 7.6 – 8.12				
8	October 18 – 22	9.13 9.14	Surface Integrals Stokes' Theorem	1*, 2*,4, 6*,18*,20* 1*,2*,4*,5,6*
9	October 25 – 29	9.16 17.1	Divergence Theorem Complex Numbers	1,2*,4*,6*,11*,13,14 2*,4*,6, 18*, 30*, 34*,40
10	November 1 – 5	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*
11	November 8 – 12	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*
Major Exam II: Wednesday, November 11, 2015 at 5:30 PM**, Loc.:** Bld-14-108**, Material:** 9.1 – 9.16				
12	November 15 – 19	17.7 18.1	Trigonometric and Hyperbolic Functions Contour Integrals *(excluding Theorem 18.1.3)*	6,8*,10*, 16* 1,3,6*,7*,9*
13	November 22 – 26	18.2 18.4	Cauchy-Goursat Theorem Cauchy's Integral Formulas	2*,4*,5*,8,12,15* 3,4*,8*, 10*,14*,23
14	November 29 – December 3	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*
15	December 6-10	19.5 19.6	Residues and Residue Theorem Evaluation of Real Integrals	1*,2*,8*,10*,22*, 24 4*,11*,12*,32*
16	December 13		Review/Catching up	
Final Exam: Tuesday, December 22, 2015 at **08:00 AM (Comprehensive)**				

Homework problems with * should be submitted for grading.