

King Fahd University of Petroleum & Minerals
Department of Mathematics and Statistics

MATH 302

Syllabus – Term 143

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

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|--------------------------|--|---------------------------------------|
| 1. Major Exam I: | 25% (100 points),
Material: 9.1 – 9.16 | Thursday, June 25, 2015 at 10:30 AM |
| 2. Major Exam II: | 25% (100 points),
Material: 7.6 – 8.12 | Thursday, July 30, 2015 at 10:30 AM |
| 3. Class Work: | 15% (60 points) | Quizzes + Homework + Attendances |
| 4. Final Exam: | 35% (140 points)
Comprehensive | Thursday, August 13, 2015 at 07:00 PM |

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	June 07-11	9.1 9.5 9.6 9.7 9.8	Vector Functions Directional Derivatives Tangent Planes and Normal Lines Curl and Divergence Line Integrals	1,2, 15*,18*,33*,36*,41* 2,6*,8*,12*,14,23* 2, 6*, 16*, 34*, 38* 4,8*,10*,26*, 29, 30 4*,6,8*,14*,23*,30*,34*
2	June 14-18	9.9 9.12 9.13 9.14 9.16	Independence of Path Green's Theorem Surface Integrals Stokes' Theorem Divergence Theorem	2*,4*,6,12*,15*,22*,25* 1*,2*,4*,7,19*,20*, 29* 1*, 2*,4, 6*,18*,20* 1*,2*,4*,5,6* 1,2*,4*,6*,11*,13,14
3	June 21-25	7.6 8.2 8.3	Vector Spaces (<i>restricted to \mathbb{R}^n only</i>) Systems of Linear Algebraic Equations Rank of a Matrix	1*, 2*, 3*, 22*, 23*,26* 1*,6, 7*, 10*, 12* 4*, 8*,9, 10*, 14*
Major Exam I: Thursday, June 25, 2015 at 10:30 AM, Loc.: Bld-59-1013, Material: 9.1 – 9.16				
4	June 28-July 2	8.6 8.8 8.10 8.12	Inverse of a Matrix (<i>only using Theorem 8.6.4</i>) The Eigenvalue Problem Orthogonal Matrices (<i>excluding example 4</i>) Diagonalization (<i>excluding example 6</i>)	1,2*,19*,25,28,30*, 51,52* 1*,6, 8*,16*,20 5*,6,8*,9*,16, 18* 1,2*,4,12, 14*, 26, 28*
5	July 5-9	17.1 17.2 17.3 17.4 17.5	Complex Numbers Powers and Roots Sets in the Complex Plane Functions of a Complex Variable Cauchy-Riemann Equations	2*,4*,6, 18*, 30*, 34*,40 6*,8*,12,16,33*,34* 4*,5*,8*,23 6*,8*,10*,12*,14,21*,28,32* 1*,2*,4*,5,6*,8,22*
Ramadhan Break July 12-23				
6	July 26-30	17.6 17.7 18.1	Exponential and Log. Functions Trigonometric and Hyperbolic Functions Contour Integrals (<i>excluding Theorem 18.1.3</i>)	2*,4,8*,13*, 28*,32*, 47* 6,8*,10*, 16* 1,3,6*,7*,9*
Major Exam II: Thursday, July 30, 2015 at 10:30 AM, Loc.: Bld-59-1013, Material: 7.6 – 8.12				
7	August 02-06	18.2 18.4 19.2 19.3 19.4	Cauchy-Goursat Theorem Cauchy's Integral Formulas Taylor Series (<i>Definition & Examples</i>) Laurent Series (<i>Definition & Examples</i>) Zeros and Poles	2*,4*,5*,8,12,15* 3,4*,8*, 10*,14*,23 2*,4*,6*,12 2*,6*,10*,21*,25,26*,27*,28* 2*,4*,6*,8*,10*,14*,16*
8	August 9-11	19.5 19.6	Residues and Residue Theorem Evaluation of Real Integrals	1,2,8,10,22, 24 4,11,12,32
Final Exam: Thursday, August 13, 2015 at 07:00 PM (Comprehensive)				

Homework problems with * should be submitted for grading.