

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

MATH 302

Syllabus – Term 141

Coordinator: Dr. Mohammad Kafini

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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 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: 7.6 – 8.12 | Thursday, Oct. 16, 2014 at 5:45 PM |
| 2. Major Exam II: | 25% (100 points),
Material: 9.1 – 9.14 | Thursday, Nov. 20, 2014 at 5:45 PM |
| 3. Class Work: | 15% (60 points) | Quizzes + Homework + Attendances |
| 4. Final Exam: | 35% (140 points)
Comprehensive | Tuesday, Dec. 30, 2014 at 08:00 AM |

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	Aug. 31 – Sep. 4	7.6	Vector Spaces (<i>restricted to \mathbb{R}^n only</i>)	1*, 2*, 3*, 22*, 23*, 26*
2	Sep. 7 – 11	8.2 8.3	Systems of Linear Algebraic Equations Rank of a Matrix	1*, 6, 7*, 10*, 12* 4*, 8*, 9, 10*, 14*
3	Sep. 14 – 18	8.6 8.8	Inverse of a Matrix (<i>only using Theorem 8.6.4</i>) The Eigenvalue Problem	1, 2*, 19*, 25, 28, 30*, 51, 52* 1*, 6, 8*, 16*, 20
4	Sep. 21 – 25*	8.10 8.12	Orthogonal Matrices (<i>excluding example 4</i>) Diagonalization (<i>excluding example 6</i>)	5*, 6, 8*, 9*, 16, 18* 1, 2*, 4, 12, 14*, 26, 28*
*National Day-Holiday: Sep. 23. Id al-Adha Vacation: Sep. 26 - Oct. 11, 2014.				
5	Oct. 12 – 16	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, 23* 2, 6*, 16*, 34*, 38*
Major Exam I: Thursday, Oct. 16, 2014 at 5:45-7:45 PM, Loc.: Bld-54, Material: 7.6 – 8.12				
6	Oct. 19 – 23	9.7 9.8	Curl and Divergence Line Integrals	4, 8*, 10*, 26*, 29, 30 4*, 6, 8*, 14*, 23*, 30*, 34*
7	Oct. 26 – 30	9.9 9.12	Independence of Path Green's Theorem	2*, 4*, 6, 12*, 15*, 22*, 25* 1*, 2*, 4*, 7, 19*, 20*, 29*
8	Nov. 2 – 6	9.13 9.14	Surface Integrals Stokes' Theorem	1*, 2*, 4, 6*, 18*, 20* 1*, 2*, 4*, 5, 6*
9	Nov. 9 – 13	9.16 17.1	Divergence Theorem Complex Numbers	1, 2*, 4*, 6*, 11*, 13, 14 2*, 4*, 6, 18*, 30*, 34*, 40
10	Nov. 16 – 20	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*
Major Exam II: Thursday, Nov. 20, 2014 at 5:45-7:45 PM, Loc.: Bld-54, Material: 9.1 – 9.14				
11	Nov. 23 – 27	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*
12	Nov. 30 – Dec. 4	17.7 18.1	Trigonometric and Hyperbolic Functions Contour Integrals (<i>excluding Theorem 18.1.3</i>)	6, 8*, 10*, 16* 1, 3, 6*, 7*, 9*
13	Dec. 7 – 11	18.2 18.4	Cauchy-Goursat Theorem Cauchy's Integral Formulas	2*, 4*, 5*, 8, 12, 15* 3, 4*, 8*, 10*, 14*, 23
14	Dec. 14 – 18	19.2 19.3 19.4	Taylor Series (<i>Definition & Examples</i>) Laurent Series (<i>Definition & Examples</i>) Zeros and Poles	2*, 4*, 6*, 12 2*, 6*, 10*, 21*, 25, 26*, 27*, 28* 2*, 4*, 6*, 8*, 10*, 14*, 16*
15	Dec. 21 – 25	19.5 19.6	Residues and Residue Theorem Evaluation of Real Integrals	1, 2, 8, 10, 22, 24 4, 11, 12, 32
Final Exam: Tuesday, Dec. 30, 2014 at 08:00 AM (Comprehensive)				

Homework problems with * should be submitted for grading.