

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

SYLLABUS (Term 122)

Coordinator: Dr. Suliman S. Al-Homidan  
Instructors: Dr. Othman Echi & Dr. M. Tahir Mustafa

<b>Course:</b>	Math 302
<b>Title:</b>	Engineering Mathematics
<b>Textbook:</b>	Advanced Engineering Mathematics (Fourth Edition) by D.G. Zill and W.S. Wright, International Edition.
<b>Objectives:</b>	This course is designed to expose electrical and other engineering students to some basic ideas in vector calculus, linear algebra and complex numbers.
<b>Catalogue Description</b>	Vector analysis including vector fields, gradient, divergence, curl, line and surface integrals, Gauss' and Stokes' theorems. Introduction to complex variables, vector spaces and subspaces. Linear independence, basis and dimension, solution of linear equations, orthogonality, eigenvalues and eigenvectors.

**Grading Policy**

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

**Instructor: Dr. Othman Echi**      **Office:** 5-201/4      **Tel:** 860-1802  
**E-mail:** [echi@kfupm.edu.sa](mailto:echi@kfupm.edu.sa)      **Webpage:** <http://faculty.kfupm.edu.sa/MATH/echi/>

**Instructor: Dr. M. Tahir Mustafa**      **Office:** 5-305      **Tel:** 860- 4181  
**E-mail:** [tmustafa@kfupm.edu.sa](mailto:tmustafa@kfupm.edu.sa)      **Webpage:** <http://faculty.kfupm.edu.sa/math/tmustafa/>

**Coordinator: Dr. Suliman S. Al-Homidan**  
**Office:** 5-427      **Tel:** 860-4490      **E-mail:** [homidan@kfupm.edu.sa](mailto:homidan@kfupm.edu.sa)  
**Webpage:** <http://faculty.kfupm.edu.sa/math/homidan/>

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

**EXAMS:**

- 1. Major Exam I:**      Tuesday, February 26, 2013  
Material: 7.6, 8.2, 8.3, 8.6, 8.8, 8.10, 8.12
- 2. Major Exam II:**      Saturday, April 6, 2013  
Material: 9.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.12, 9.13, 9.14.
- 3. Final Exam:**      Monday, May 20, 2013      (8:00 am)

Week	Date	Sec.	Material	Homework
1	Jan. 26 - 30	7.6	Vector Spaces ( <i>restricted to <math>R^n</math> only</i> )	1*, 2*, 3*, 22*, 23*, 26*
2	Feb. 2 - 6	8.2 8.3	Systems of Linear Algebraic Equations Rank of a Matrix	1*, 7*, 12* 8*, 9, 10, 14*
3	Feb. 9 - 13	8.6 8.8	Inverse of a Matrix ( <i>only using Theorem 8.6.4</i> ) The Eigenvalue Problem	1, 2*, 19*, 30*, 51, 52* 1*, 8*, 16*
4	Feb. 16 - 20	8.10 8.12	Orthogonal Matrices ( <i>excluding example 4</i> ) Diagonalization ( <i>excluding example 6</i> )	5*, 8*, 9*, 16 1, 2*, 4, 14*, 28*
5	Feb. 23- 27	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*, 14, 23* 2, 6, 16*, 34*, 38*
6	Mar. 2- 6	9.7 9.8	Curl and Divergence Line Integrals	4, 8*, 10*, 26*, 29, 30 4, 6, 14*, 23*, 30*, 34*
7	Mar. 9 - 13	9.9 9.12	Independence of Path Green's Theorem	2*, 6, 20*, 12, 15*, 22*, 25* 1*, 2*, 4, 7, 17, 20*, 29*
8	Mar. 16 - 20	9.13 9.14	Surface Integrals Stokes' Theorem	1*, 2*, 4, 6, 18* 1*, 2*, 5, 6*
<b>Midterm Vacation: March 23-27</b>				
9	Mar. 30-Apr. 3	9.16 17.1	Divergence Theorem Complex Numbers	1, 2*, 4*, 11*, 13, 14 2*, 6, 18*, 30*, 34*, 40
10	Apr. 6 - 10	17.2 17.4 <sup>1</sup>	Powers and Roots Functions of a Complex Variable	6*, 12, 16, 33*, 34* 8*, 10*, 12, 14, 21*, 28, 32*
11	Apr. 13- 17	17.5 17.6	Cauchy-Riemann Equations Exponential and Log. Functions	1*, 2*, 5, 6*, 8, 22* 2, 4, 8, 13*, 28*, 32*, 47*
12	Apr 20 - 24	17.7 18.1	Trigonometric and Hyperbolic Functions Contour Integrals ( <i>excluding Theorem 18.1.3</i> )	6, 8, 10*, 16* 1, 3, 7*, 9*
13	Apr. 21-May 1	18.2 18.4	Cauchy-Goursat Theorem Cauchy's Integral Formulas	2*, 5*, 8, 12, 15* 3, 4*, 10*, 14*, 23
14	May 4 - 8	19.2 <sup>2</sup> 19.3 19.4	Taylor Series ( <i>Definition &amp; Examples</i> ) Laurent Series ( <i>Definition &amp; Examples</i> ) Zeros and Poles	2*, 4* 2*, 4, 6*, 21*, 25, 26*, 27, 28 2*, 4*, 6*, 10*, 14*, 16*
15	May 11- 15	19.5 19.6	Residues and Residue Theorem Evaluation of Real Integrals	1, 2, 8, 10, 22, 24 11, 12, 32

**Only homework problems with \* should be submitted for grading.**

<sup>1</sup>“Equations of open/closed disks in complex form” to be explained before 17.4

<sup>2</sup>“Sequences and series” to be briefly discussed before 19.2