Department of Mathematical Sciences, KFUPM

Math 302 Syllabus (061)

Dr. K. M. Furati

Course Title: Engineering Mathematics

Textbook: Advanced Engineering Mathematics by P. O'Neil, 5th edition (2003).

Course Description: 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.

Wk	Date	Sec	Material	Homework
1	Sep 9 – 13, Th 14	5.4	The Vector Space R^n	5, 8, 16, 17, 19, 21
		5.5	Linear Dependence, Spanning Sets, and Dimension in R^n	6, 14, 17, 24, 26
2	Sep 16 – 20	6.5	Solution of Homogeneous Systems of Linear Equations	3, 17, 18, 20
		6.7	Nonhomogeneous Systems of Linear Equations	9, 13, 15
National Holiday: Sat, Sep 23.				
3	Sep 25 – 27	8.1	Eigenvalues and Eigenvectors	6, 16, 21, 23, 26
		8.2	Diagonalization of Matrices	6, 7, 18
4	Sep 30 – Oct 4	8.3	Orthogonal and Symmetric Matrices	1, 6, 12, 14
		11.1	Vector Functions of One Variable	6, 10, 16, 18
5	Oct 7 – 11	11.4	The Gradient Field and Directional Derivatives	6, 10, 14, 20, 22, 28
		11.5	Divergence and Curl	4, 6, 10, 12, 19
Eid Vacation				
6	Oct 28 – Nov 1	12.1	Line Integrals	6, 12, 20, 22, 27, 29
		12.2	Green's Theorem	2, 4, 12, 14, 17
7	Nov 4 – 8	12.3	Independence of Path and Potential Theory in the Plane	4, 8, 12, 18, 20
		12.4	Surfaces in 3-Space and Surface Integrals	4, 8, 10, 16
8	Nov 11 – 15	12.7	The Divergence Theorem of Gauss	6, 8, 10, 12, 14, 16
		12.8	The Integral Theorem of Stokes	4, 6, 14, 22
9	Nov 18 – 22	20.1	Complex Number	2, 10, 22, 28, 34
		20.2	Loci and Sets of Points in the Complex Plane	1, 2, 6, 7, 16, 31, 36, 37
10	Nov 25 – 29	21.1	Complex Functions: Limits, Continuity and Derivatives	2, 3, 4, 5, 6, 12
11	Dec 2 – 6	21.2	Power Series	3, 9, 11
		21.3	The Exponential and Trigonometric Functions	2, 4, 6, 8, 11, 15, 19, 23
		21.4	The Complex Logarithm	3, 4, 6, 8
12	Dec 9 – 13	21.5	Powers	2, 6, 10, 14, 20, 23, 24
		22.1	Curves in the Plane	1, 3, 7, 9
		22.2	The Integral of a Complex Function	2, 5, 8, 20, 24
13	Dec 16 – 20	22.3	Cauchy's Theorem	2, 4, 5, 12, 17
		22.4	Consequences of Cauchy's Theorem	4, 6, 8, 15
Eid Vacation				
14	Jan 6 – 10	23.2	The Laurent Expansion	1, 3, 5, 6, 7, 13
		24.1	Singularities	3, 6, 10, 16, 18, 19
		24.2	The Residue Theorem	1, 2, 3, 5, 9, 16, 24, 25
15	Jan 13 – 17	24.3. 5	Evaluation of Real Integrals	29, 31, 33, 41
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