

Math 301 Syllabus (052)

Dr. K. M. Furati

Course Title:	Methods of Applied Mathematics
Textbook:	Advanced Engineering Mathematics by Zill and Cullen (2nd Edition, 1999)
Course Description:	Special functions. Bessel's functions and Legendre polynomials. Vector analysis including vector fields, divergence, curl, line and surface integrals, Green's, Gauss' and Stokes' theorems. Systems of differential equations. Sturm-Liouville theory. Fourier series and transforms. Introduction to partial differential equations and boundary value problems.

Wk	Date	Sec	Material	Homework
1	Feb 12 – 15, Th 16	9.1	Vector Functions	6,10,17,26,38,41,45
		9.5	The Directional Derivative	1,6,10,17,22,30
		9.7	Divergence and Curl	2,6,14,22,28
2	Feb 18-22	9.8	Line Integrals	2,8,12,16,34
		9.9	Line Integrals Independent of the Path	1,4,15,21,24,26
3	Feb 25- March 1	9.12	Green's Theorem	1,4,6,18,24
		9.13	Surface Integrals	3,5,10,28,34
4	March 4-8	9.14	Stokes' Theorem	2,3,6,8,16
		9.16	Divergence Theorem	1,4,8,11
5	March 11-15	4.1	Definition of the Laplace transform	2,5,14,26,30,38,40(b)
		4.2	Inverse Transform, Transforms of Derivatives	1,10,18,19,32,36
6	March 18-22	4.3	Translation Theorems	6,13,20,24,37,48,63
		4.4	Additional Properties	2,10,16,22,38,46
		4.5	Dirac Delta Function	1,4,8,12
7	March 25-29	12.1	Orthogonal Functions	3,6,11,14,21
		12.2	Fourier Series	2,6,11,20
<i>April 1-2 Midterm Break</i>				
8	April 3-5	12.3	Fourier Cosine and Sine Series	1,8,12,16,25,36
		12.4	Complex Fourier Series	3,6,11
9	April 8-12	12.5	Sturm-Liouville Theorem	2,4,6,12
10	April 15-19	12.6	Bessel and Legendre Series	2,4,6,8,15,20
11	April 22-26	13.1	Separable Partial Differential Equation	1,8,13,16,20,26,28
		13.3	Heat Equation	2,3,6,8,9
12	April 29-May 3	13.4	Wave Equation	2,4,8,10,16
		13.5	Laplace's Equation	1,4,7,10,14
13	May 6-10	14.2	Problems in Polar and Cylindrical Coordinates	3,4,9,10
		14.3	Problems in Spherical Coordinates	1,5,11,12
14	May 13-17	15.2	Applications of the Laplace Transform	2,4,8,10,14,28
15	May 20-24	15.3	Fourier Integral Theorem	1,5,10,18
		15.4	Fourier Transforms	2,6,10,12,16
16	May 27-28	Revision		