King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
SYLLABUS
Summer Term: 2017-2018 (173)

Coordinator: Prof. Nasser-eddine Tatar
Course #: MATH 333
Title: Methods of Applied Mathematics 1
Textbook: Advanced Engineering Mathematics by Zill and Wright (Fifth Edition)

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. Sturm-Liouville theory. Laplace transforms. Fourier series and transforms. Introduction to partial differential equations and boundary value problems in rectangular, cylindrical and spherical coordinates.
Prerequisite: MATH 202 or MATH 260

Week	Date	Sections	Topics	Suggested Homework Problems
1	June 24-28 *June 30	9.1 9.5 9.7 9.8 9.9	Vector Functions The Directional Derivative Curl and Divergence Line Integral Independence of the Path	1,12,16,17,21,26,33,41 2,7,9,14,17,21,23,32,29 2,6,10,14,1722,27 2,6,8,11,16,19,24,28,33 1,10,15,18,21,26
2	July 1-5	9.12 9.13 9.14 9.16	Green's Theorem Surface Integrals Stokes' Theorem Divergence Theorem	2,4,6,9,18,23,25 2,5,10,13,18,22,25,33 1,3,6,8,13,17 2,4,7,11,14
3	July 8-12	4.1 4.2 4.3 4.4 4.5	Definition of the Laplace transform Inverse Transform, Transforms of Derivatives Translation Theorems Additional Operational Properties The Dirac Delta Function	1,5,14,26,30,37,43 2,10,19,22,24,32,35 2,8,13,20,24,31,37,48,55,63 1,10,16,22,27,31,38,46 1,4,8,12
4	July 15-19	12.1 12.2 12.3 12.5 12.6	Orthogonal Functions Fourier Series Fourier Cosine and Sine Series Sturm-Liouville Theorem Bessel and Legendre Series	2,6,11,13 2,4,6,12 1,6,12,17,20 1,8,12,16,25,35,38 2,4,6,8,15,20
5	July 22-26	13.1 13.3 13.4 13.5 14.2	Separable Partial Differential Equations Heat Equation Wave Equation Laplace's Equation Problems in Cylindrical Coordinates	2,8,12,16,22,26,27 2,3,6 1,6,9,16,23 2,4,7,10,14 2,4,9,12
6	July 29-Aug 2	14.3 15.2 15.4	Problems in Spherical Coordinates Applications of the Laplace Transform Fourier Transforms	2,5,11,12 2,4, 10,14,18,24 1,6,10,12,16
7	Aug 5-9		Catch up and Review	

***Normal Monday class:** June 30

Grading Policy: Exam I	**25 % (100 pts)**	
Exam II	**25 % (100 pts)**	
Final Exam	**35 % (140 pts)**	**Monday, Aug. 13 (8-11am)** **Comprehensive**