King Fahd University of Petroleum & Minerals

Department of Mathematics and Statistics

MATH 301

Syllabus – Term 153

Coordinator: Dr. Ahmad Y. Al-Dweik

Course Code: MATH 301

Title: Methods of Applied Mathematics

Textbook: **Advanced Engineering Mathematics** (Fifth Edition) by D.G. Zill and W.S. Wright, International Edition.

Catalogue 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.

Grading Policy

1. **Major Exam I:** 25% (100 points) Saturday, **July 30, 2016** at **9:00 AM**
   Material: **9.1 – 9.16**
2. **Major Exam II:** 25% (100 points) Saturday, **August 13, 2016** at **9:00 AM**
   Material: **4.1 – 12.3**
3. **Class Work:** 15% (60 points) Quizzes + Homework + Attendances
4. **Final Exam:** 35% (140 points) Tuesday, **August 30, 2016** at **07:00 PM**
   Comprehensive

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	July 11 – 14	9.1 9.5 9.7 9.8	Vector Functions The Directional Derivative Curl and Divergence Line Integrals	1,12,16,17,21,26,33, 41 2,7,9,14,17,21,23,32,29 2,6,10,14,17,22,27 2,6,8,11,16,19,24,28,33
2	July 16 – 21	9.9 9.12 9.13 9.14	Independence of the Path Green's Theorem Surface Integrals Stokes' Theorem	1,10,15,18,21,26 2,4,6,9,18,23,25 2,5,10,13,18,22,25,33 1,3,6,8,13,17
3	July 24 – 28	9.16 4.1 4.2 4.3	Divergence Theorem Definition of the Laplace transform Inverse Transform, Transforms of Derivatives Translation Theorems	2,4,7,11,14 1,5,14,26,30,37,43 2,10,19,22,24,32,35 2,8,13,20,24,31,37,48,55,63
Exam I: Saturday, July 30, 2016 at **9:00 AM**				
4	July 31 – August 4	4.4 4.5 12.1 12.2	Additional Operational Properties The Dirac Delta Function Orthogonal Functions Fourier Series	1,10,16,22,27,31,38,46 1,4,8,12 2,6,11,13 1,6,12,17,20
5	August 7- 11	12.3 12.5	Fourier Cosine and Sine Series Sturm-Liouville Theorem	1,8,12,16,25,35,38 2,4,6,12
Exam II: Saturday, August 13, 2016 at **9:00 AM**				
6	August 14- 18	12.6 13.1 13.3 13.4	Bessel and Legendre Series Separable Partial Differential Equations Heat Equation Wave Equation	2,4,6,8,15,20 2,8,12,16,22,26,27 2,3,6 1,6,9,16,23
7	August 21- 25	13.5 14.2 14.3 15.2	Laplace's Equation Problems in Cylindrical Coordinates Problems in Spherical Coordinates Applications of the Laplace Transform	2,4,7,10,14 2,4,9,12 2,5,11,12 2,4,10,14,18,24
8	August 28–29	15.3 15.4	Fourier Integral Fourier Transforms	1,4,10 1,6,10,12,16
Final Exam: Tuesday, August 30, 2016 at **07:00 PM (Comprehensive)**				