

# King Fahd University of Petroleum and Minerals

Department of Mathematics and Statistics

## SYLLABUS

Semester I, 2013-2014 (131)

(Dr. Muhammad Yousuf)

**Course #:** Math 513

**Title:** Mathematical Methods for Engineers

**Textbook:** Advanced Engineering Mathematics with MatLab, Dean G. Duffy, 3<sup>rd</sup> Edition

**Extra** • Beginning Partial Differential Equations, P. V. O’Neil.

**References** • Advanced Engineering Mathematics by Zill and Wright.

**Objective:** This course aims to introduce some necessary concepts of Engineering Mathematical Methods such as Fourier and Laplace transforms, Sturm-Liouville problems, basic PDE’s, and some matrix theory.

**Outcomes:** By the end of this course, the student should be able to

- perform the Fourier and Laplace transforms of some commonly used functions
- solve the basic linear Laplace, wave, and heat equations and Sturm-liouville problems
- solving and computing solutions to systems of linear equations
- using Matlab to solve computational problems

Week	Chapters	Material	Problem	Page
1-2	4	Fourier Series	5,9	190
			4, 13	203
3-4	5	The Fourier Transform	3	247
			7	248
			14	250
			4	253
			4	265
			5, 6, 7	285
5-6	6	The Laplace Transform	2, 4, 6,	296
			13, 14, 16	297
			13, 20, 26	310
			37	311
			10, 12	327
			14	328
			5, 7, 9	331
			7	350
			11, 19	351
			33	352
<b>Midterm Break</b>				
7-8	9	The Sturm-Liouville Problem	3, 4	441
			3	445
			4	450
9-10	10	The Wave Equation	6	520
			8, 10	521
			3, 6	531
			1, 3	544
			7	545
11	11	The Heat Equation	5	599
			9, 11, 15	600
			7, 8	622
			2, 3	635
12	12	The Laplace Equation	7,12	696
			35	706
			1	712
13-14	14	Linear Algebra		
15		Catch up and Review		

**Grading Policy:** Project, Homework and Assignments 30%, Midterm 30%, Final 40%

### Teaching Schedule

<b>Day/Time</b>	12-12:50	1-1:50	4-4:50	5-6:15
Sunday	Office Hour R: 5-403	Math 201 R: 59-1011		
Monday			Office Hour R: 5-403	Math 513 R: 6-106
Tuesday	Office Hour R: 5-403	Math 201 R: 59-1011		
Wednesday			Office Hour R: 5-403	Math 513 R: 6-106
Thursday	Office Hour R: 5-403	Math 201 R: 59-1011		

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