Department of Mathematics & Statistics, KFUPM

Math 431 Syllabus (161, 2016-2017)

Dr. K. M. Furati

Course Title: Introduction to Measure Theory and functional analysis

Textbook: M. Brokate and G. Kersting, Measure and Integral, Birkhauser, 2015

Course Description: Lebesque integral functions, Fatou's lemma, dominated convergence theorem, measurable functions, measurable sets, non-measurable sets, Egoroff's theorem, convergence in measure. Lp-spaces, Riesz-Fischer theorem, geometry of Hilbert spaces, orthonormal sequences, Fourier series, bounded linear functionals, Hahn-Banach theorem, linear functionals on Hilbert and Lp-spaces.

Prerequisite Math 411

Grading Policy

HW	30%
Midterm	30%
Final	40%

Material and coverage plan

Ch	Topic	# wks
1	Introduction	1
2	Measurability	1
3	Measures	2
4	The integral of nonnegative functions	2
5	Integrabel functions	2
6	Convergence	2
12	Hilbert spaces	2
13	Banach spaces	2