

Methods of Applied Mathematics

MATH 570a

Fall 2013

Text: Linear Operator Theory in Science and Engineering, by

A. W. Naylor and G. R. Sell

SPECIAL NOTE: The 425A prerequisite will be waived. See Amy Yung in Mathematics Office 104, 213-740-8168

The techniques of this course provide a powerful framework for analyzing infinite dimensional problems arising in virtually every modeling problem in Applied Mathematics and the Physical Sciences in the broadest sense. The course is intended to serve primarily students of the Applied Sciences: Economics, Engineering, Physics and Applied Mathematics Majors.

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Course web page: <http://www-bcf.usc.edu/~rsacker/M570a.html>

Grader: TBA

Midterm Exam 1:	Wednesday	October 2
Midterm Exam 2:	Wednesday	November 6
Final	Monday	TBA

Last day to drop without “W”:

September 13

Last day to drop with “W”:

November 15

GRADING POLICY

2 Midterm exams – 40% of grade

Homework – 35%

Final – 25%

Class Schedule

Weeks		Chapter
1 - 3	SPECIAL NOTE: The 425A prerequisite will be waived. See Metric spaces, subspaces and product spaces, open and closed sets, convergence and equivalent metrics	3A
4 - 5	Countability, compactness, completeness and completions, contraction mapping theorem, integral equations	3B
6 - 7	Linear spaces, Hamel basis and dimension, function spaces, linear transformations, isometries, inverse transformations, projections, extension of linear transformations, linear functionals, hyperplanes, conjugate space,	4
8 - 9	Banach space, continuous linear transformations, spaces of linear operators, closed operators, complementary subspaces, dual spaces	5A
10 -11	Inner product and Hilbert spaces, orthonormal basis, generalized Fourier series	5B
12 -13	Continuous linear functionals, Fourier transform pair, unitary operators	5B
14 -15	Self-adjoint operators, unbounded operators, position and momentum operators, Heisenberg uncertainty principle	12 & 13