

## Math 500 – Applied Analysis I

**Course Description from Bulletin:** Metric and Normed Spaces; Continuous Functions; Contraction Mapping Theorem; Topological Spaces; Banach Spaces; Hilbert Spaces; Eigenfunction expansion. (3-0-3)

**Enrollment:** Elective for AM and other majors.

**Textbook(s):** John Hunter and Bruno Nachtergaele, *Applied Analysis* (Corrected reprinting, 2005), World Scientific, ISBN 9810241917.

**Other required material:**

**Prerequisites:** MATH 400 or consent of the instructor

**Objectives:**

1. Students will learn basic methods and theory in fundamentals of analysis.
2. Students will focus on those parts of modern analysis that are most useful in applications.
3. Students will improve their problem solving skills in analysis.
4. Students will improve their presentation and writing skills.

**Lecture schedule:** 3 50 minutes (or 2 75 minutes) lectures per week

<b>Course Outline:</b>	<b>Hours</b>
1. Metric spaces and Normed Spaces	6
2. Continuous Functions	6
3. Contraction Mapping Theorem	3
4. Topological Spaces	3
5. Banach Spaces	9
6. Hilbert Spaces	9
7. Eigenfunction expansion and Fourier series	6

<b>Assessment:</b>	Homework	10-30%
	Computer Programs/Project	10-20%
	Quizzes/Tests	20-50%
	Final Exam	30-50%

**Syllabus prepared by:** J. Duan, J. Frank and A. Lubin

**Date:** March 22, 2006