Spring 2011

EE436

Mathematical Foundations of Signal Processing and Control

Syllabus

Meeting times **:** Friday 14:30, 15:30, 16:30
Text **:**

- N. Kolmogorov, S. V. Fomin, "Introductory real analysis," Dover, New York, 1975
- E. Kreyszig, "Introductory functional analysis with applications," John Wiley & Sons, New York, 1989

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Summary:
Introduction to set theory. Metric spaces. Neighborhood and continuity. Convergence of sequences. Normed vector spaces. Completeness, Banach spaces. Linear operators and functionals. Inner product spaces, Hilbert spaces.

Course Outline:
Week 1: Introduction to set theory: Basics and definitions
Week 2: Decomposition of a set into classes
Week 3: Ordered sets and set systems
Week 4: Metric spaces
Week 5: Neighborhood and continuity
Week 6: Convergence, Cauchy sequences and completeness
Week 7: Midterm
Week 8: Completion of metric spaces
Week 9: Vector spaces, normed spaces
Week 10: Banach spaces
Week 11: Finite dimensional normed spaces
Week 12: Linear operators
Week 13: Inner product spaces, Hilbert spaces
Week 14: Orthogonal complements and direct sums

Grading:

Homework	30%
Midterm	30%
Final	40%