

PhD in Statistics

Functional Analysis

Academic year 2008/09

G. Treu and D. Vittone

- Convergence notions for sequences of functions. Functions series: power series, Taylor series, Fourier series.
- Topological spaces: basic notions.
- Metric spaces. Complete and compact metric spaces. The Banach-Caccioppoli fixed point theorem and applications
- Properties of some examples of metric spaces: C^k , l^p .
- Measure theory: Caratheodory construction of a measure. Examples: the Lebesgue measure, the Lebesgue-Stieltjes measure, probability measures in continuous and discrete spaces.
- The definition of integral in a measure space. In particular: the Lebesgue integral.
- L^p spaces
- Banach and Hilbert spaces: definitions and basic results.

Course schedule

January 2009:

Thursday 8, 14.30-17.30 (Vittone)

Friday 9, 9.00-12.00 (Vittone)

Monday 12, 9.00-12.00 (Treu)

Wednesday 14, 9.00-12.00 (Treu)

Monday 19, 9.00-12.00 (Treu)

Wednesday 21, 9.00-12.00 (Treu)

Monday 26, 9.00-12.00 (Treu)

Wednesday 28, 9.00-12.00 (Treu)

February 2009

Monday 2, 9.00-12.00 (Vittone)

Wednesday 4, 9.00-12.00 (Treu)

Monday 9, 9.00-12.00 (Treu)

Wednesday 11, 9.00-12.00 (Treu)

Monday 16, 9.00-12.00 (Treu)

Wednesday 18, 9.00-12.00 (Treu)

References

Kreyszig, Introductory functional analysis with applications, Wiley

Friedman, Foundations of modern Analysis, Dover

Brezis, Analisi Funzionale, Liguori

Rudin, Real and complex analysis, Mc Graw-Hill

Rudin, Functional Analysis, Mc Graw-Hill