MATH 7310: REAL ANALYSIS AND LINEAR SPACES I

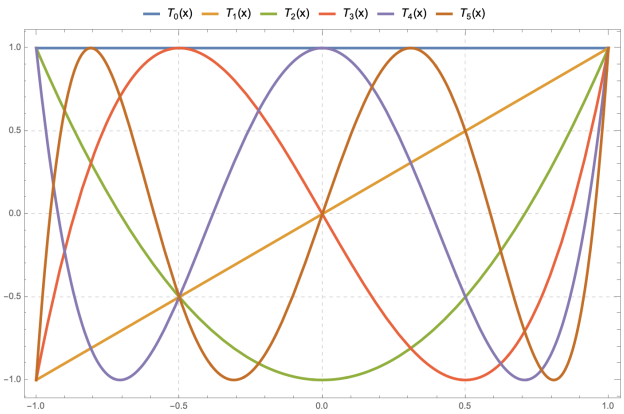
LEONID PETROV
SPRING 2019

1. *Graduate real analysis*

This course introduces students to basic analytic tools used across all of mathematics:

- Measures, including the Lebesgue measure on the line
- Lebesgue integration
- L^p and Hilbert spaces
- Absolute continuity, differentiation of measures

Additional topics included in the course will range from applications to probability (e.g., theory of conditional expectations, Gaussian measures and Gaussian Free Field, ...) to selected topics from classical analysis (orthogonal polynomials, numerical methods, steepest descent, ...), as time permits.



The first six Chebyshev polynomials of the first kind.

Prerequisites. Single variable and multi-variable Calculus (limits and continuity, differentiation and integration, series, uniform convergence, etc.), Linear Algebra (vector spaces, linear mappings, matrices, determinants, etc.), and some knowledge of set theory and topology of metric spaces.

2. *Necessary information*

Class times: TuTh 2:00PM - 3:15PM in *Kerchof Hall 317*

Instructor: Leonid Petrov

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An up to date syllabus is always on `GitHub` at https://github.com/lenis2000/Syllabi/blob/master/Syllabus_7310_s19.pdf. For direct PDF download use `this link`. LaTeX source with *changes* to the syllabus is `here` (click "History").

Office hours: Tuesday and Thursday 10-11am, except the weeks when I'm traveling.[1] Also feel free to drop in with quick questions any time, or make appointments (you can make as many appointments as you want).

[1]Note: this PDF has green clickable links.